

Geographical distributions of *Bembix* (Hymenoptera, Crabronidae, Bembicinae) in southern Africa, with notes on biology

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Abstract

Geographical distributions based on available records are presented for the 37 currently recognized species of *Bembix* Fabricius known to occur in southern Africa. These are *albata* Parker, *albicapilla* Arnold, *albofasciata* Smith, *anomalipes* Arnold, *arnoldi* Arnold, *atrospinosa* Turner, *baumanni* Handlirsch, *bubalus* Handlirsch, *cameronis* Handlirsch, *capensis* Lepeletier, *capicola* Handlirsch, *carinata* F. Smith, *cultrifera* Arnold, *denticauda* Arnold, *diversipennis* F. Smith, *flavicincta* R. Turner, *fraudulenta* Arnold, *fuscipennis* Lepeletier, *gracilens* J. Parker, *harenarum* Arnold, *karroensis* Gess, *liturata* R. Turner, *loupata* R. Parker, *massaica* Cameron, *melanopa* Handlirsch, *moebii* Handlirsch, *monedula* Handlirsch, *namibensis* Gess, *ochracea* Handlirsch, *olivata* Dahlbom, *regnata* Parker, *scaura* Arnold, *sibilans* Handlirsch, *triangulifera* Arnold, *ulula* Arnold, *venusta* Arnold, and *zinni* Gess.

A single specimen of *Bembix compedita* R. Turner has been recorded from South Africa but as the species is known principally from Malawi this requires confirmation.

Some diagnostic characters are given for the hitherto undescribed female of *namibensis*.

A range of distribution patterns are noted – narrowly endemic to widespread through the Afrotropical Region and into Egypt. Four species, *albata*, *arnoldi*, *harenarum* and *fraudulenta* appear to have strictly southern African coastal distributions.

A summary of the knowledge of flower associations, nesting and prey are given for those species for which data are available.

Keywords

Sand wasps, *Bembix*, southern Africa, distributions, flower associations, prey, nesting

Introduction

Bembix with 346 species recognised (Pulawski 2013) is by far the most species rich of the Bembicinae. It is most diverse in the Afrotropical and Australian Regions. Currently the number of recognized species recorded from southern Africa (= Africa south of latitude 15°S) appears to be 37.

The first description of a *Bembix* species from the Afrotropical Region (excluding Madagascar) was published in 1838 by Spinola. His species, *B. undulata*, allegedly came from the Cape of Good Hope but has not since been recognised.

The foundations of our knowledge of the genus in sub-saharan Africa may be considered to have been laid by two authors, Lepeletier and Dahlbom, who publishing independently but in the same year, 1845, together gave descriptions of nine species. Synonymy on the one hand and lack of recognition on the other has left us with three of these species, all common in southern Africa, *fuscipennis* Lepeletier, *capensis* Lepeletier, and *olivata* Dahlbom (= *intermedia* Dahlbom).

Smith (1856) added *carinata* and later (1873) *diversipennis* and *albofasciata*, while Magretti in 1884 and 1892 added two further species, neither since recognised.

The first comprehensive account of the genus on a world basis was published by Handlirsch (1893) in whose monograph no fewer than 17 new species from the Afrotropical Region were described. This was followed by the papers of Cameron (1908, 1910, Turner 1912a, b, 1913, 1917a, b) in each of which further species were described.

The year 1929 saw the publication of two major papers dealing with the genus – those of Parker and Arnold. Parker's published in June of that year had described eight new species from the Afrotropical Region. Arnold's paper, published in December, had 12 new species and several new sub-species.

Inevitably some synonyms and homonyms came into existence and these were for the most part dealt with by Arnold (1931) who correctly gave Parker's names priority. At the same time, however, Arnold was perhaps somewhat hasty in dismissing as synonyms, apparently without close study, some other species described as new by Parker; notably *stevensoni* Parker as a synonym of *fuscipennis* Lepeletier and *tenebrosa* Parker and *refuscata* Parker as synonyms of *diversipennis* Smith. This action by Arnold led to a pointed and critical reply by Parker (1942) which in turn was answered by Arnold (1951). Unanimity was not reached and instead the points at issue became more clouded.

Further papers having a bearing on *Bembix*, some with descriptions of new species, were published by Arnold in 1933, 1935, 1936, 1944, 1946, 1952 and 1960.

A list of a few *Bembix* species collected in South Africa by the Lund University Expedition in 1950–1951 was given by de Beaumont (1967).

Other than the brief references to nesting sites, prey and nest parasites given by Brauns (1911), Arnold (1929), Cuthbertson (1939), Hesse (1956) and Callan (1964) nothing was published on the biology of *Bembix* in the Afrotropical Region before 1970. However, the biology of the genus had been better studied in other regions. The most outstanding and inspiring account was that of Evans (1957) dealing with American species, to be followed by Evans and Mathews (1971, 1973 and 1975) and Evans and O'Neill (1988 and 2007).

In 1970 Friedrich Gess undertook an investigation of the *Bembix* specimens from the major collections of southern Africa with a view to undertaking a revision of the genus in that region. Three undescribed species and one synonymy were discovered. Some other taxonomic problems were identified but due to the inadequacy of the holdings of the relevant species and the consequent need for additional material from specific localities a revision was considered to be premature. However, Friedrich Gess (1986) published the three new species, *namibensis*, *zinni* and *karooensis*, and sank *junodi* Arnold into synonymy with *B. ulula* Arnold. In addition, in the same publication, he gave biological notes for 10 other species and a review of the nature of the prey of the genus with particular reference to the Afrotropical species. These were constituted from scattered published records (including those given in F.W. Gess 1981) which in some instances are obscure and generally overlooked, from specimen labels of the Albany Museum material and from personal observations. This represented as nearly as possible a complete compilation of the biological knowledge of *Bembix* and was intended to form a foundation on which to build. Subsequently, a study was made of the nesting of *Bembix bubalus* at Oudtshoorn in the Little Karoo (Gess and Gess 1989).

Recently Friedrich Gess revisited the possibility of undertaking a revision of *Bembix* and to this end he determined a considerable number of specimens assembled since his earlier investigations. Regrettably, due to his ill health over many years and his subsequent death on 6 August 2013 the revision did not come to be. However, the wealth of material determined greatly increases the knowledge of geographical distributions of many of the species and offers previously unpublished records of floral associations, nesting and prey. Towards the end of his life Sarah Gess offered to take his unfinished manuscript and from it to produce a paper to insure that the work already done by Friedrich Gess would not be wasted. The present contribution is therefore a compilation of material examined by and determined by Friedrich together with some of his taxonomic and morphological notes. To this Sarah has added some additional records from specimens not seen by nor determined by Friedrich Gess but extracted from the Iziko South African Museum entomology collection Specify database available at www.sabif.co.za, photographs of a pair of specimens of most species, maps depicting the known geographical distributions in southern Africa, comments on the geographical the distributions of the species, and of their flower associations, nesting and prey, indicating whether or not such data are known. Clearly, although the contribution is based on the work of Friedrich Gess, it has not been checked or approved by him and therefore should errors be found he should not be held responsible for them.

As is the established practice of Friedrich Gess, the notation used for expressing geographic coordinates is as in the gazetteer of *The Times Atlas of the World* (Bartholomew et al. 1981). The figures before the stop are degrees, those after the stop are minutes; the stop is not a decimal point. Co-ordinates have been given in square brackets in the text for those localities for which none are given on the data labels. In instances where the locality given is imprecise the word *circa* is added.

For plotting the distribution maps ArcMap 10.1 GIS by ESRI was used with the co-ordinates in decimal degrees.

Acronyms for institutions in which material is housed follow Evenhuis (2013). These are: AMGS = Albany Museum, Grahamstown, South Africa; BMNH = The Natural History Museum, London; DMSA = Durban Museum, South Africa; MHNG = Muséum d'Histoire Naturelle de Genève, Genève, Switzerland; RMCA = Musée Royale de l'Afrique Centrale, Tervuren, Belgium; SANC = National Collection of Insects, Pretoria, South Africa; SMNS = Staatliches Museum für Naturkunde, Stuttgart, Germany; NMBZ = Natural History Museum of Zimbabwe, Bulawayo (formerly National Museum of Southern Rhodesia); NMNW = National Museum of Natural Science, Windhoek, Namibia; NMW = Naturhistorisches Museum Wien, Austria; SAMC = South African Museum, Iziko Museums of Cape Town, South Africa; TMSA = Transvaal Museum, now National Museum of Natural History, Ditsong Museum, Pretoria, South Africa; ZMHB = Zoologisches Museum der Humboldt Universität, Berlin.

In the lists of material examined the data are given as on the specimen labels. Any additions are given in square brackets. The collectors are given in the data string in parenthesis after collection date. Where 'collectors' are given as an institution on the specimen data labels and not as an individual the names are as on the labels and are therefore not necessarily current institutional names and are not necessarily given in a consistent format. The acronyms in square brackets denote the institutions in which the specimens are currently housed and therefore follow current names for the institutions as given in the paragraph above.

Taxonomy

Bembix afra Handlirsch

http://species-id.net/wiki/Bembix_afra

Bembix afra Handlirsch, 1893: 740, pl. 1, fig. 20, ♂ (Holotype, ♂, no locality, South Africa, in SMNS); Handlirsch 1895: 1002 (Cape Province); Dalla Torre 1897: 502 (in catalogue of world Hymenoptera); Arnold 1929: 342, figs 11, 11a, 11b, pl. 6, fig. 6, ♂ (in revision of southern African Sphecidae); 1930: 21 (in checklist of Afrotropical Sphecidae).

Bembix afra Handlirsch, R. Bohart and Menke 1976: 545 (in checklist of world Sphecidae); Pulawski 2013: 2 (in catalogue of world Sphecidae sensu lato).

Material examined. SOUTH AFRICA: Melboschstrand (sic), 7.iv.1947 (Nat. Museum S. Rhodesia), ♂; Modderfontein, 15.ii.1925 (Brauns), ♂ [SAMC ex NMBZ].

“Melboschstrand” probably meant to be Melkboschstrand, now Melkbosstrand, on the southwest coast.

“Modderfontein” could be one of any of the following Modderfonteins near: Kamiesberg, Carnarvon, Britstown, De Aar, Aliwal North, Wuppertal, Sutherland, Merveville or Cape Town.

Additional records extracted from database of specimens in collection of SAMC. ZIMBABWE: Rua, 15.xii.1975 (A.J.S. Weaving), sex not given, determiner not given. SOUTH AFRICA: Western Cape: Hex River [32.24S, 19.46E], 1.i.1884 (collector not given), sex not given, determiner J.C. Bridwell; Hex River, 1.xi.1885 (collector not given), sex not given, determiner not given.

Geographical distribution. It would appear from the few records available that this species is present in the Western Cape, South Africa. The accuracy of the determination of the single specimen from Zimbabwe has not been determined.

Floral associations. Unknown.

Nesting. Unknown.

Prey. Unknown.

Bembix albata J. Parker

http://species-id.net/wiki/Bembix_albata

Fig. 1a

Bembix albata J. Parker, 1929: 127, pl. 7, figs 85, 86, ♂, ♀ (Holotype, ♂, Lüderitz Bay, Namibia, in ZMHB); Lohrmann 1948: 449 (member of *arnoldi* species group); R. Bohart and Menke 1976: 545 (in checklist of world Sphecidae as *B. abata*); Gess and Gess 2003: 121 (flower visiting records); Pulawski 2013: 2 (in catalogue of world Sphecidae sensu lato).

Bembex albata J. Parker, Arnold 1931: 216 (justification of synonymy with *Bembex albopilosa*).

Bembex albopilosa Arnold, 1929: 378, figs 41, 41a–c, pl. 6, fig. 40, ♂ (Holotype, ♂, Klipfontein, South Africa, in SAMC and paratype, Swakopmund, Namibia, in SAMC) (in revision of southern African Sphecidae); Arnold 1930: 21 (in checklist of Afrotropical Sphecidae); Arnold 1931: 209 and 216 (synonymized with *B. albata*); R. Bohart and Menke 1976: 545 (in checklist of world Sphecidae).

Note. *Bembix albata* was described by Parker from five males and three females from Lüderitzbucht, Namibia (formerly South West Africa) (xii.1903, L. Schultze). The synonym, *Bembex albopilosa* was described by Arnold from a male from Swakopmund (Namibia, and a male (holotype) from Klipfontein (L. Péringuey). The exact locality of this latter locality is unclear but is taken to be the place of this name in the vicinity of Hondeklip Bay, Namaqualand.

Material examined. NAMIBIA: Carlowa's Camp, Angra Fria (SE 1812 Aa) [= 18.00–18.15S, 12.00–12.15E], 14–16.xi.1970 (collector?) (H1066), 16 ♀♀ [NMNW]; 4 km. N [of] Cape Cross (21.43S, 13.59E), 18.iii.2000, 3 ♀♀, 1 ♂ (visiting white flowers of *Brownanthus kuntzei* (Schinz) Ihlenf. & Bittrich, Aizoaceae: Mesembryanthe-

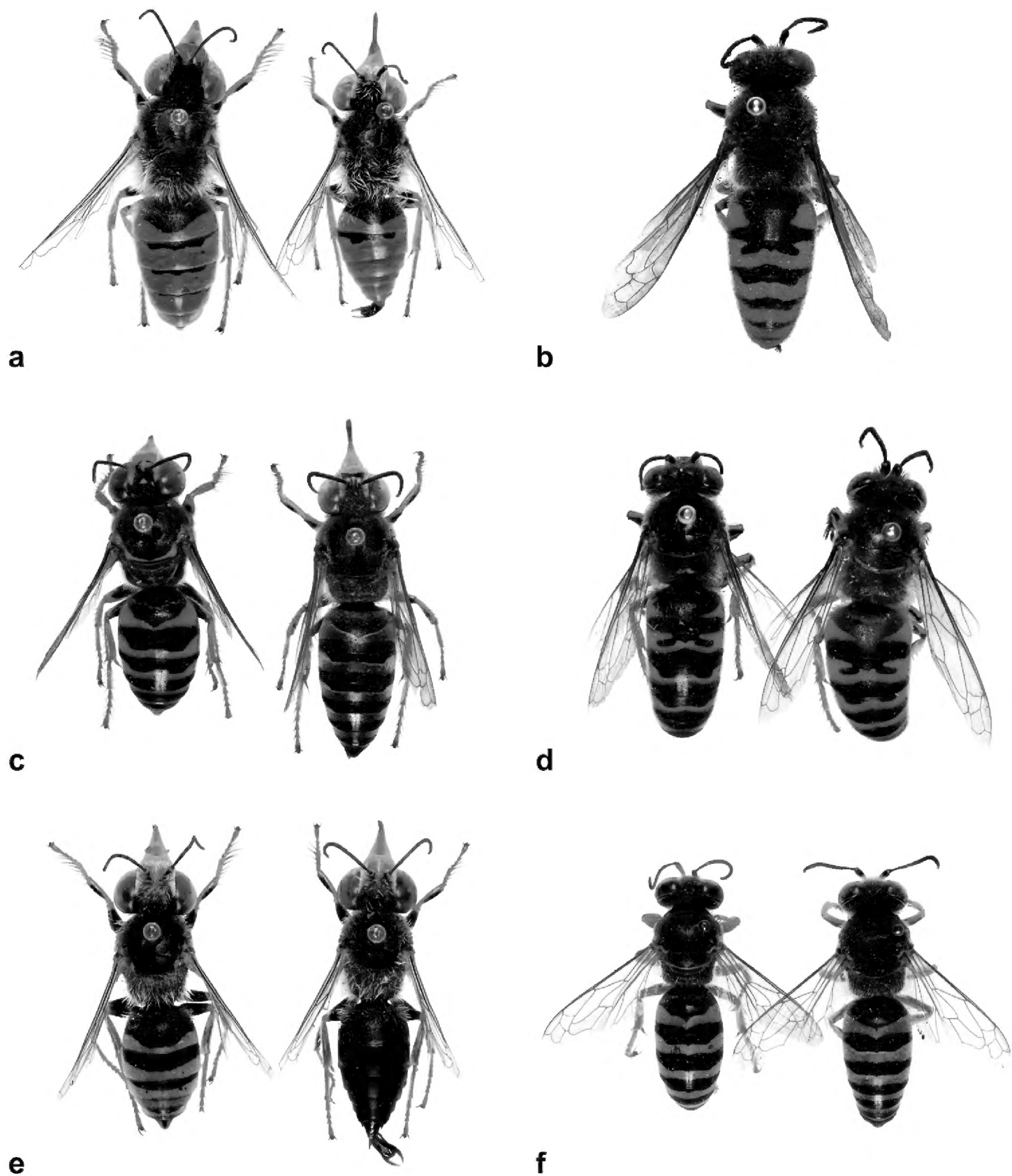


Figure 1. *Bembix* spp.: **a** *albata*, female, male **b** *albicapilla*, female **c** *albofasciata*, female, male **d** *anomalipes*, female, male **e** *arnoldi*, female, male **f** *atrospinosa*, female, male. (approximate lengths of females: **a** 21 mm; **b** 18.5 mm; **c** 17 mm; **d** 19.5 mm; **e** 17 mm; **f** 19.5 mm)

ma); NW of Cape Cross (21.44S, 13.59E), 14.iii.1999, 20 ♂♂ (visiting white flowers of *Brownanthus kuntzei*); 113 km. N [of] Swakopmund (21.51S14.05E), 18.iii.2000, 1 ♀ (visiting white flowers of *Brownanthus kuntzei*); 110 km. NW [of] Swakopmund (21.50S, 14.05E), 15.iii.1999, 1 ♀ (visiting white flowers of *Psilocaulon salicornioides* (Pax) Schwantes, Aizoaceae: Mesembryanthema); 53 km N [of] Swakopmund (22.16S,

14.23E), 19.111.2000, 5 ♀♀ (visiting white flowers of *Brownanthus kuntzei*); 10 km N [of] Swakopmund at wireless mast (22.35S, 14.32E), 21.iii.1997, 10 ♀♀, 1 ♂ (4 ♀♀ visiting white flowers of *Psilocaulon salicornioides*; 4 ♀♀ visiting white flowers of *Brownanthus kuntzei*); same locality, 11.iv.1998, 4 ♀♀, 4 ♂♂ (visiting white flowers of *Brownanthus kuntzei*); Swakopmund, Swakop R[iver] at bridge (22.42S, 14.32E), 16.iii.1999, 1 ♀, 3 ♂♂ (visiting white flowers of *Zygophyllum stapffii* Schinz, Zygophyllaceae) – (all F.W. and S.K. Gess) [all AMGS]; Swakopmund [22.40S, 14.32E], vii.1931 (Bradfield), 1 ♂; same locality 21.xii.1977 (Empey), 2 ♀♀, 4 ♂♂; same locality, 17.xii.1978 (Empey), 1 ♀ [AMGS]; Swakopmund, 15.xi.1984 (F.J. Herbst), 1 ♀; Swakopmund, 16.xi.1984 (F.J. Herbst), 3 ♀♀, 1 ♂; Swakopmund, 28.ii.1966 [F. Herbst], 2 ♀♀ [AMGS]; Rooibank Desert Park [near Walvis Bay] [23.11S, 14.49E], 15.xii.1977 (Empey), 2 ♀♀, 2 ♂♂ [AMGS]; Silvia Hill, Lüderitz (SE 2514 Bb) [25.09S, 14.51E], 15–16.ix.1971 (collector ?) (H4131), 2 ♀♀; Agate Beach, Lüderitz (SE 2615 Ca) [26.36S, 15.11E], 21-x.1970 (collector ?) (H 1065), 2 ♂♂; Elizabeth Bay, Lüderitz (SE 2615 Cc) [26.55S, 15.11E], 1–2.iii.1972 (collector ?) (H7106), 18 ♀; [NMNW]; Lüderitzbucht [26.29S, 15.09E], 26.iii.1929 (Fr. Eberlanz), 1 ♂ [AMGS]; Lüderitz, Dias Point (26.39S, 15.05E), 29.ii.2000, 32 ♀♀ (visiting pink flowers of ?*Brownanthus* sp.); same locality, 1.iii.2000, 12 ♀♀ (11 ♀♀ visiting mounds of *Zygophyllum clavatum* Schltr. & Diels, Zygophyllaceae; 1 ♀ visiting pink flowers of *Brownanthus* sp.); Kaukausib Spring – Gryllenthal, (26.58S, 15.31E), 5.ix.2002, 3 ♀♀ (hunting flies on *Euphorbia* sp. and resting on sand) (all F.W. and S.K. Gess) [all AMGS]; Bogenfels, Lüderitz (SE 2715 Ad) [= 27.46S, 15.39E], 28–29.ii.1972 (collector ?) (H7082), 1 ♀ [NMNW]; E [of] Oranjemund, foot of Skilpad (28.28S, 16.40E), 23.ix.1997, 4 ♀♀ (visiting white flowers of ?*Psilocaulon* sp., Aizoaceae: Mesembryanthema); between Oranjemund and check point (28.34S, 16.28E), 26.ix.1997, 1 ♀; Oranjemund, fringes of golf course (28.37S, 16.27E), 22.xi.1997, 1 ♂ (visiting pale pink flowers of *Drosanthemum* sp., Aizoaceae: Mesembryanthema) – (all F.W. and S.K. Gess) [all AMGS]. NORTHERN CAPE: Grootderm [near Alexander Bay] [28.36S, 16.40E], 10.xii.1949 (G. van Son) 2 ♂♂ [Dipsong]; Port Nolloth [29.15S, 16.52E], i.1922, 2 ♂♂ (W. Austen).

Geographical distribution. This species appears to have a mainly coastal distribution (Fig. 2a). At present it is known only from Angra Fria in northern Namibia to Klipfontein near Hondeklip Bay, Namaqualand, South Africa, that is for over 12 degrees latitude and in excess of 1400 km of coastline. It is probable that its distribution may extend northwards into Angola. The only record slightly inland from the coast is that for the sandy Sperrgebiet (southern Namib Desert) at Kaukausib Spring, Gryllenthal.

Floral associations. Recorded from two plant families: Aizoaceae (Mesembryanthema, *Brownanthus kuntzei* (Schinz) Ihlenf. & Bittrich, *Psilocaulon salicornioides* (Pax) Schwantes and *Drosanthemum* sp.); Zygophyllaceae (*Zygophyllum clavatum* Schltr. & Diels and *Zygophyllum stapffii* Schinz).

Nesting. Unknown but most likely nesting in the sandy hummocks. At localities along the coast, sampled by F. W. and S. K. Gess, the species was found principally

associated with the sandy hummocks formed around *Brownanthus*, *Psilocaulon* and *Zygophyllum clavatum* and visiting the flowers of these plants.

Prey. Three females were recorded hunting flies on *Euphorbia* sp. at Kaukausib Spring.

***Bembix albicapilla* Arnold**

http://species-id.net/wiki/Bembix_albicapilla

Fig. 1b

Bembix albicapilla Arnold, 1946: 93, figs 40, 40a–c, ♂ (Holotype, ♂, Zimbabwe, Insuza River, in SAMC ex NMBZ); R. Bohart and Menke 1976: 545 (in checklist of world Sphecidae); Pulawski 2013: 2 (in catalogue of world Sphecidae sensu lato).

Material examined. ZIMBABWE. Holotype, Insuza R. [circa 19.56S, 25.50E], Forest, Vic. Road, 24.xii.1939, 1 ♂; Sawmills [19.35S, 28.02E], 25.xii.1939 (R.H.R. Stevenson), 1 ♂, [both SAMC ex NMBZ].

Arnold described *Bembix albicapilla* from the unique male specimen from Insuza Forest. The specimen from Sawmills is generally melanistic when compared with the type. Most noticeable in this respect is the labrum which instead of being wholly ochreous as in the type is mostly black except for a narrow ochreous streak in the midline, somewhat expanded distally but not reaching proximal third. In addition the lemon yellow band on the first tergite is widely interrupted in the middle and the black spots on the second and third tergites are fused with the transverse basal black bands.

Geographical distribution. Recorded from two sites in Zimbabwe (Fig. 2b).

Floral associations. Unknown.

Nesting. Unknown.

Prey. Unknown.

***Bembix albofasciata* Smith**

http://species-id.net/wiki/Bembix_albofasciata

Fig. 1c

Bembex albofasciata F. Smith, 1873: 296, ♂ (Holotype or syntypes, ♂, no locality, KwaZulu-Natal, South Africa, in BMNH); Handlirsch 1893: 891 (original description copied); Dalla Torre 1897: 502 (in catalogue of world Hymenoptera); Arnold 1929: 336, figs 7, 7a, 7b, pl. 6, figs 1, 2, ♂, ♀ (in revision of southern African Sphecidae).

Bembex Karschii Handlirsch, 1893: 742, pl. 1, fig. 21, pl. 6, fig. 18, ♂, ♀ (Syntypes, no localities, Cape Province and Transvaal, South Africa, in BMNH, MHNG, ZMHB, SMNS); Dalla Torre 1897: 507 (in catalogue of world Hymenoptera); Turner 1912b: 373, (synonymy of *B. karschii* with *B. albofasciata*).

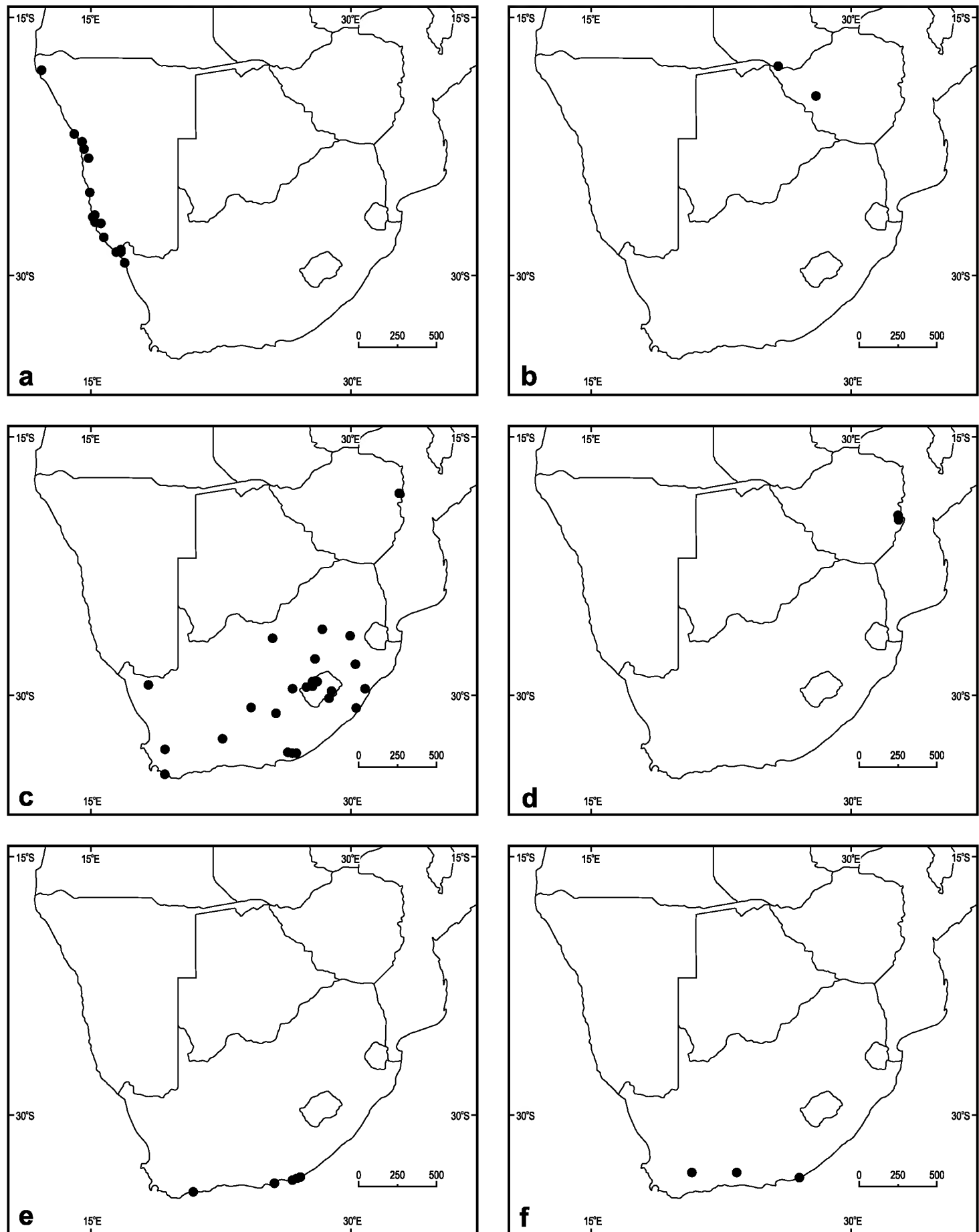


Figure 2. Distributions of collection records of *Bembix* spp.: **a** *albata* **b** *albicapilla* **c** *albofasciata* **d** *anom-alipes* **e** *arnoldi* **f** *atrospinosa*.

Bembix albofasciata Smith, R. Bohart and Menke 1976: 545 (in checklist of world Sphecidae); Gess 1981: 21 (nest, prey); 1986: 149–151 (nesting, nest Fig. 27, plants visited, prey); Gess and Gess 2003: 121–122 (flower visiting records); Evans and O’Neil 2007: 183 (summary of information on nesting habits); Pulawski 2013: 3 (in catalogue of world Sphecidae sensu lato).

Note. Turner (1912b: 373) stated that the range does not appear to be very extensive, the series in the National Collection (i.e. The Natural History Museum London) being mostly from the southern Transvaal, with one or two specimens from Lesotho (as Basutoland) and northern KwaZulu-Natal (as Zululand).

Material examined. ZIMBABWE: Inyanga [18.13S, 32.44E], 20.i.1948, 1 ♀ [SAMC ex NMBZ]; Inyanga, 7.ii.1940 (G. Arnold) 1 ♀ [SAMC ex NMBZ]; Inyanga, 9.ii.1940 (G. Arnold), 1 ♀ [SAMC ex NMBZ]; Rhodes Inyanga National Park [18.19S, 32.44E], 13.i.1955 (B.R.S., P.G.) 1 ♂ [AMGS]. LESOTHO: Bokong P.O. [29.20S, 28.18E], 26.xii.1946 (A. Jacot-Guillarmod), 1 ♂ [AMGS]; Mahlatsa [29.10S, 27.57E], 30.xii.1951 (A. Jacot-Guillarmod), 1 ♀ [AMGS]; Mamathes [29.08S, 27.51E], ii.1940 (C. Jacot-Guillarmod), 1 ♂ [AMGS]; Mamathes, 1.1943 (C. Jacot-Guillarmod), 1 ♀ [AMGS]; Mamathes, 26.ii.1944 (C. Jacot-Guillarmod), 1 ♀ with prey Asilidae [AMGS]; Mamathes, 13.i.1945 (A. Jacot-Guillarmod), 1 ♀ [AMGS]; Mamathes 31.xii.1945 (C. Jacot-Guillarmod), 1 ♀ [AMGS]; Mamathes, 13.i.1946 (Miss M.H. Marr), 1 ♀ [AMGS]; Mamathes, 8.xii.1946 (C. Jacot-Guillarmod), 1 ♂ [AMGS]; Mamathes, 28.xii.1946 (C. Jacot-Guillarmod), 1 ♂ [AMGS]; Mamathes, 19.i.1947 (C. Jacot-Guillarmod), 1 ♀ [AMGS]; Mamathes, 18.xii.1949 (C. Jacot-Guillarmod), 1 ♀ with prey Diptera [AMGS]; Mamathes, 15.i.1950 (C. Jacot-Guillarmod), 1 ♀ [AMGS]; Mamathes, 21.i.1950 (C. Jacot-Guillarmod), 1 ♂ [AMGS]; Mamathes, 29.i.1950 (C. Jacot-Guillarmod), 1 ♂ [AMGS]; Mamathes, 4.ii.1950 (C. Jacot-Guillarmod), 1 ♀ with prey *Eristalis tenax* (L.) (Syrphidae) [AMGS]; Mamathes, 14.ii.1950 (C. Jacot-Guillarmod), 1 ♂ [AMGS]; Mamathes, 10.xii.1950 (C. Jacot-Guillarmod), 1 ♂ [AMGS]; 2.xii.1951 (C. Jacot-Guillarmod), 1 ♂ [AMGS]; Mamathes, 2.xii.1951 (A. Jacot-Guillarmod), 1 ♂ [AMGS]; Mamathes, 1.i.1952 (C. Jacot-Guillarmod), 1 ♀ on *Calpurnia intrusa* [Fabaceae: Papilionoideae]; Mamathes, 27.i.1952 (C. Jacot-Guillarmod), 1 ♀ [AMGS]; Mamathes, 3.ii.1952 (C. Jacot-Guillarmod) 1 ♀ [AMGS]; Mamathes, 15.ii.1952 (C. Jacot-Guillarmod), 1 ♀ [AMGS]; Mamathes, 31.xii.1952 (C. Jacot-Guillarmod), 1 ♂ [AMGS]; Mamathes, 2.i.1953 (C. Jacot-Guillarmod), 1 ♂, 1 ♀, on *Calpurnia intrusa* [Fabaceae: Papilionoideae] [AMGS]; Mamathes, 6.i.1953 (C. Jacot-Guillarmod), 2 ♂♂ [AMGS]; Mamathes, 28.ii.1956 (C. Jacot-Guillarmod), 2 ♀♀ [AMGS]; Mamathes, 2.i.1959 (C. Jacot-Guillarmod), 1 ♀ [AMGS]; Mamathes, i.1961 (C. Jacot-Guillarmod), 1 ♀ [AMGS]; Mamathes, 20.xii.1930 (C. Jacot-Guillarmod), 1 ♀ [SAMC ex NMBZ]; Mamathes, iii.1940 (C. Jacot-Guillarmod), 1 ♀ [DMSA]; Mamathes, 27.xii.1946 (C. Jacot-Guillarmod), 1 ♂ [SAMC ex NMBZ]; Mamathes, 28.xii.1946 (C. Jacot-Guillarmod), 1 ♂ [SAMC ex NMBZ]; Mamathes, 6.i.1953 (C. Jacot-Guillarmod), 1 ♂ [AMGS]; Qachasnek [30.7S, 28.42E], 14.i.1969 (C. Jacot-Guillarmod), 3 ♀♀ [AMGS]; Roma [29.28S, 27.44E], 17.xii.1964 (C. Jacot-Guillarmod), 2 ♂♂ [AMGS]; Teyateyaneng [29.9S, 27.45E], 25.xi.1945 (C. Jacot-Guillarmod), 1 ♂ [AMGS]; Tlametlu River [29.28S, 27.25E], 26.i.1955 (C. Jacot-Guillarmod), 1 ♀; n[ea]r Morija [circa 29.38S, 30.48E], (5400 f[ee]t, 25.i.1955 (L. Bevis), 1 ♀ [DMSA]; Mashai R[iver] [circa 29.40S, 28.47E], 24.i.1939 (Nat. Museum S. Rhodesia), 1 ♂ [SAMC ex NMBZ]; Pulane, n[ea]r Mateka [29.14S, 27.53E], 5.i.1954 (L. Bevis), 1 ♂ [DMSA]; n[ea]r Posong [??], 8.i.1953 (L. Bevis),

1 ♂ [DMSA]. SOUTH AFRICA: GAUTENG: Benoni [26.11S, 28.18E], 28.xi.1964 (Empey), 1 ♀ [AMGS]; Ermelo [26.32S, 29.59E] 26.xi.1948, (N.C. Mokhele), 1 ♀ [AMGS]; Strubens Valley, Florida [26.31S, 29.57E], 26.i.1966 (Empey), 1 ♀ [AMGS]. LIMPOPO: Sabie, 25.iii.1970 (Empey), 1 ♀ [AMGS]. NORTH WEST PROVINCE: Delarey [Delareyville] [26.41S, 25.26E], i.1917 (Brauns), 1 ♂ [SAMC ex NMBZ]. FREE STATE: Chicago, Lindley District [27.53S, 27.55E] (D.J. Brothers), 1 ♂, 13 ♀♀, 1 ♀ with prey *Chrysomya marginalis* Wied. (Calliphoridae), 1 ♀ with prey *Sarcophaga* (Calliphoridae) [AMGS]; Dewetsdorp [29.35S, 26.40E], xii.1951 (R. Howell), 1 ♂ (bearing pollinia of Apocinaceae (formerly Asclepiadaceae) attached to most of the pulvilli) [AMGS]. KWAZULU-NATAL: Dundee [28.11S, 30.15E], 21.i.1961 (Empey), 1 ♀ [AMGS]; Oribi Gorge [30.43S, 30.16E], xi.1960, 1 ♀ [National Museum Zimbabwe]. WESTERN CAPE: Upper Sources Olifants River, Ceres [circa 33.05S, 19.14E], xii.1949 (Mus. Staff), 1 ♀, 2 ♂♂ [SAMC]; Hermanus [34.27S, 19.12E], i.1952 (Nat. Museum S. Rhodesia), 1 ♂ [SAMC ex NMBZ]; Spitzkop, Meirings Poort [32.26S, 22.34E], i.1935 (Museum Staff), 2 ♀♀ (SAMC). EASTERN CAPE: Baviaanskloof (30.39S, 24.15E), 5–9.ii.1996 (A. Weaving), 1 ♂ [AMGS]; Belmont Valley, Grahamstown [33.19S, 26.38E], 20.i.1970 (F.W. Gess), 2 ♀♀ on *Foeniculum vulgare* Mill. (Apiaceae); Belmont Valley, Grahamstown, 24.i.1970 (F.W. Gess), 1 ♀ on *Foeniculum vulgare* Mill. (Apiaceae); Belmont Valley, Grahamstown, 24.i.1970 (C. Jacot-Guillarmod), 8 ♀♀ on *Foeniculum vulgare* Mill. (Apiaceae); Belmont Valley, Grahamstown, 17–25.i.1970 (J.G.H. Londt), 1 ♂, 7 ♀♀ on *Foeniculum vulgare* Mill. (Apiaceae); Belmont Valley, Grahamstown, 5.ii.1970 (F.W. Gess), 2 ♀♀ on flowering lucerne (Fabaceae: Papilionoideae); Hilton farm [33.15S, 26.20E], Grahamstown, 6.xii.1974 (D.W. Gess), 1 ♀, 1 ♂; same locality, 11.xii.1975 (F.W. Gess), 1 ♂; same locality, 29.i.–3.ii.1976 (F.W. Gess), 1 ♀ (Malaise trap); same locality, 9.xii.1977 (D.W. Gess), 1 ♀; same locality, 20.xii.1977 (D. W. Gess), 1 ♂; same locality, 2.i.1978 (D.W. Gess), 1 ♀, 1 ♂; same locality, 12.i.1978 (D.W. Gess), 3 ♀♀; same locality, 13.i.1978 (D.W. Gess), 2 ♀♀, 2 ♂♂; same locality, 13.i.1978 (H.W. Gess), 1 ♂; same locality, 17.i.1978 (F.W. Gess), 1 ♂; same locality, 24.i.1978 (D.W. Gess), 1 ♀; same locality, 24.i.1978 (H.W. Gess), 1 ♀; same locality, 7.ii.1978 (D.W. Gess), 1 ♀; same locality, 9.ii.1978 (F.W. Gess), 7 ♀♀, 1 ♂ (1 ♀ captured at nest entrance with prey: *Lomatia pulchriceps* Loew, ♂, Bombyliidae); 14.ii.1978 (F.W. Gess), 1 ♀; same locality, 16.ii.1978 (F.W. Gess), 1 ♀, 1 ♂; same locality, 23.ii.1978 (F.W. Gess), 1 ♂; same locality, 2.xii.1979 (F. W. and S.K. Gess), 1 ♂ (on yellow flowers of *Senecio pterophorus* DC, Asteraceae); same locality, 7–11.xii.1979 (F.W. Gess), 1 ♂ (Malaise trap); same locality, 3.xii.1982 (F.W. and S.K. Gess), 1 ♀; same locality, 9.xii.1982 (F.W. and S.K. Gess), 1 ♀; same locality, 30.i.1986 (F.W. and S.K. Gess), 1 ♀ [all AMGS]; Coombs Valley (33.16S, 26.50E), 2.i.1976 (C. Jacot-Guillarmod), 1 ♀ [AMGS]; Paradise Kloof, Grahamstown [33.18S, 26.32E], 3.xii.1964 (D.J. Brothers), 1 ♀ [AMGS]; Port Elizabeth [30.58S, 25.37E], 7.i.1961 (B.S. Brunhuber), 2 ♀♀ [AMGS].

Geographical distribution. Widespread from southern Zimbabwe southwards to the Eastern and Western Cape provinces of South Africa (Fig. 2c).

Floral associations. Recorded from four plant families: Asteraceae (*Senecio pterophorus* DC); Apiaceae (*Foeniculum vulgare* Mill.); Fabaceae (Papilionoideae, *Calpurnia intrusa* (R. Br. in W.T. Aiton) E. Mey and lucerne); and Apocynaceae (formerly Asclepiadaceae, determined from pollinia attached to specimen).

Nesting. At Hilton near Grahamstown 14 nests were investigated. All were single celled, sloping burrows in friable soil. The main shaft terminated in a spur. Provisioning is progressive.

Prey. Recorded taking 10 families of Diptera: Tabanidae, Asilidae, Muscidae, Stratiomyidae, Conopidae, Calliphoridae, Mydidae, Tachinidae, Bombyliidae, and Syrphidae.

***Bembix anomalipes* Arnold**

http://species-id.net/wiki/Bembix_anomalipes

Fig. 1d

Bembex anomalipes Arnold, 1929: 334, figs 5, 5a–e, pl. 6, fig. 5 (Holotype, ♂, Penkridge, near the eastern border of Zimbabwe, in SAMC and paratype, ♂, Mbanza-Mgungu, Zaire (as Thysville, Congo), in RMCA) (in revision of southern African Sphecidae); Arnold 1930: 21 (in checklist of Afrotropical Sphecidae).

Bembix anomalipes Arnold, R. Bohart and Menke 1976: 545 (in checklist of world Sphecidae); Pulawski 2013: 7 (in catalogue of world Sphecidae sensu lato).

Female. Undescribed. In size, coloration, vestiture and in general appearance generally very similar to male. Face at level of antennal sockets wider (relative to width of head) than in male; scapes normal; first joints of anterior tarsi only slightly less dilated than in male, spines on basal joint not lanceolate; tarsi of middle legs similar. Cu-a of hindwing slightly inclined towards the base as in male. Sternite II as in male, closely punctate except in the middle near the apex, fairly shining.

This species is characterised in both sexes by the labrum furnished with a very fine median longitudinal carina, expanded over the distal third into a low raised tubercle whose upper surface is slightly hollowed out. This development is unique, in the southern African species at least.

Material examined. ZAMBIA: Abercorn [now Mbala] [8.50S, 31.24E], x.1943 (Nat. Museum S. Rhodesia), 1 ♂, 1 ♀ [SAMC ex NMBZ]; Abercorn, vi.1945 (Nat. Museum S. Rhodesia), 1 ♀ [SAMC ex NMBZ]; Abercorn, viii.1945 (Nat. Museum S. Rhodesia), 1 ♀ [SAMC ex NMBZ]. ZIMBABWE: Penkridge [19.33S, 32.47E], 23.x.1927 (R.H.R. Stevenson), holotype ♂ [SAMC ex NMBZ]; Risitu River, Melsetter [19 48S, 32 52E], xi.1967 (Nat. Museum S. Rhodesia), 2 ♀♀ [SAMC ex NMBZ].

Geographical distribution. From the few specimens available this species appears to have a northern distribution (Fig. 2d), not having been recorded south of Zimbabwe.

Flower associations. Unknown.

Nesting. Unknown.

Prey. Unknown.

***Bembix arnoldi* Arnold**

http://species-id.net/wiki/Bembix_arnoldi

Fig. 1e

Bembex arnoldi Arnold, 1929: 353, figs 20, 20a, ♂ (Syntypes, Jeffrey's Bay, Eastern Cape, South Africa, in TMSA) (in revision of southern African Sphecidae); Arnold 1930: 21 (in checklist of Afrotropical Sphecidae); Arnold 1936: 27, pl.1, fig. 8, ♀. [non] *Bembex arnoldi* Arnold, 1929: 354, pl. 6, fig. 15, ♀ [= *carinata* F. Smith]

Bembix arnoldi Arnold, Lohrmann, 1948: 449 (member of *arnoldi* species group of *Bembix*); Gess 1986: 151–152 (nesting, flower visiting, hunting and prey capture); Gess and Gess 1988: 246–247, Fig. 14.19 (habitat and hunting); Gess and Gess 1998: 35, Fig. 22.18 (habitat, hunting); Evans and O'Neil 2007: 183 (summary of nesting habits); not listed in R. Bohart and Menke 1976; Pulawski 2013: 8 (in catalogue of world Sphecidae sensu lato).

Note. Arnold (1929: 353) and (1936: 27) gives the author of this species as Brauns but as Brauns never published the description (or even the name) and as Arnold clearly published the description on Brauns behalf (as is evident from his comments (1936: 27) then the author must be Arnold himself. The correct form is thus not *B. arnoldi* Brauns but *B. arnoldi* Arnold!

Brauns (Arnold 1929: 354) recorded the species in addition from Jeffrey's Bay. [This seems to have been in error, the female concerned being that of *carinata* Smith (see Arnold 1936: 28)]. Brauns' observations were that this species is confined to sand dunes on the seashore.

Material examined. SOUTH AFRICA: EASTERN CAPE: Kleinemonde [33.32S, 27.03E], ix.1956 (M.J.A. Cooke) [AMGS], 1 ♂; Port Alfred [33.36S, 26.55E], 1.ii.1959 (E.McC. Callan), 1 ♀ [AMGS]; Kasouga Dunes [33.39S, 26.44E], xii.1954 Cooke), 1 ♀ [AMGS]; Boknes (33.43S, 26.35E), 16.i.1984 (D.W. Gess), 1 ♀, 3 ♂♂ (on flowers of *Phylohydrax carnosa* (Hochst) Puff, Rubiaceae) [AMGS]; same locality and date, (H.W. Gess), 2 ♀♀ (on flowers of *Phylohydrax carnosa*) [AMGS]; same locality, 20.i.1984 (D.W. Gess), 2 ♀♀ (on flowers of *Phylohydrax carnosa*) [AMGS]; same locality, 24.i.1984 (F.W. and S.K. Gess), 2 ♀♀, 6 ♂♂ (on flowers of *Phylohydrax carnosa*) [AMGS]; same locality and date (R.W. Gess), 3 ♂♂ (on flowers of *Phylohydrax carnosa*) [AMGS]; same locality, 9.i.1986 (D.W. Gess), 4 ♀♀ (on flowers of *Phylohydrax carnosa*) [AMGS]; Zwartkops [now Swartkops] [33.52S, 25.36E], Port Elizabeth, 25.xi.1919 (collector variously given as C.B. Krüger or C.B. Kruger), 2 ♂♂ [AMGS], 1 ♂ [SAMC ex NMBZ]; Zwartkops, Algoa Bay, 25.xi.1921 (Dr Brauns), 1 ♂ [AMGS], 1 ♂ [SAMC ex NMBZ]; Zwartkops, Port Elizabeth, 25.xi.1921 (Dr Brauns), 2 ♂♂ [SAMC ex NMBZ], 1 ♂ [DMSA]. WESTERN CAPE: Port Beaufort [34.24S, 20.49E], 26.i.2004 (F.W. and S.K. Gess), 1 ♂ (visiting flowers of *Scaevola plumieri* (L.) Vahl, Goodeniaceae on dunes of seashore [AMGS].

Geographical distribution. The species appears to have a strictly coastal distribution (Fig. 2e). At present it is known from the Eastern Cape, from Kleinemonde to Zwartkops near Port Elizabeth and from the Western Cape at Port Beaufort. At both Boknes and Port Beaufort the species was found frequenting the first line of supra-littoral dunes and visiting the flowers associated with these dunes.

Floral associations. Recorded from two plant families: Rubiaceae (*Phylohydrax carnosa* (Hochst.) Puff); Goodeniaceae (*Scaevola plumieri* (L.) Vahl).

Nesting. Unknown but most likely nesting in the supra-littoral dunes. At Boknes was repeatedly observed digging burrows on the seaward side of the fore-dunes.

Prey. One record only, Diptera: Muscidae (on ocean wrack on tideline).

***Bembix atrospinosa* R. Turner**

http://species-id.net/wiki/Bembix_atrospinosa

Fig. 1f

Bembex atrospinosa R. Turner, 1917b: 289, ♂, ♀ (Syntypes, South Africa, Eastern Cape, Willowmore, South Africa, in BMNH or TMSA?); Arnold 1929: 335, figs 6, 6a-e, ♂, ♀ (in revision of southern African Sphecidae); Arnold 1930: 21 (in checklist of Afrotropical Sphecidae).

Bembix atrospinosa R. Turner, R. Bohart and Menke 1976: 545 (in checklist of world Sphecidae); Pulawski 2013: 9 (in catalogue of world Sphecidae sensu lato).

Note. Described by R. Turner from Willowmore (December, Dr Brauns) and recorded by Arnold from the same locality.

Material examined. SOUTH AFRICA: EASTERN CAPE: Willowmore [33.15S, 23.30E], 17.xii.1916 (Brauns), 1 ♀ [AMGS], 1 ♂ [SAMC ex NMBZ]; same locality and collector, 15.xii.1917, 1 ♂, 20.xii.1917, 1 ♀, 25.xii.1917, 1 ♀ [all 3 SAMC ex NMBZ]; Kleinemonde [33.32S, 27.03E], i.1905 (Mrs G. White), 1 ♂ [AMGS]. WESTERN CAPE: Rooinek [Pass], Laingsburg Distr. [33.20S, 20.52E], i.1949 (Zinn-Hesse Mus. Exp.), 2 ♀♀ [SAMC].

Geographical distribution. From the few specimens available apparently southern, Eastern and West Cape provinces of South Africa (Fig. 2f).

Flower associations. Unknown.

Nesting. Unknown.

Prey. Unknown.

***Bembix baumanni* Handlirsch**

http://species-id.net/wiki/Bembix_baumanni

Fig. 3

Bembix Baumannii Handlirsch, 1893c: 813, pl. 2, fig. 18, pl. 5, fig. 24, ♂ (Holotype, ♂, South Africa, former Transvaal, no locality, in MHNG); Dalla Torre



Figure 3. *Bembix baumani*, male. (approximate length: 16.5 mm).

1897: 502 (in catalogue of world Hymenoptera); Arnold 1929: 359, figs 24, 24a (in revision of southern African Sphecidae).

Bembix baumanni Handlirsch, de Beaumont 1967b: 506 (South West Africa [Namibia], Kakaoveld, Sanitatas, about 85 miles WSW Ophopoho); R. Bohart and Menke 1976: 545 (in checklist of world Sphecidae); Pulawski 2013: 9 (in catalogue of world Sphecidae sensu lato).

Additional records extracted from database of specimens in collection of SAMC.

SOUTH AFRICA: Eastern Cape: Dunbrody [33.34S, 25.41E] (no date) (O'Neil), no sex given, determined by G. Arnold. Six additional records with no determiner are given, five from the Western Cape and one from Namibia.

Geographical distribution. The few records available are for Namibia, the former Transvaal, the Eastern Cape and possibly Western Cape. Clearly further records are required to clarify the distribution pattern.

Flower associations. Unknown.

Nesting. Unknown.

Prey. Unknown.

***Bembix bubalus* Handlirsch**http://species-id.net/wiki/Bembix_bubalus

Figs 4a–c, 6a

Bembex bubalus Handlirsch, 1893: 719, pl. 1, fig. 8, pl. 3, fig. 22, pl. 4, fig. 9, pl. 5, fig. 39, pl. 6, fig. 6, ♂, ♀ (Syntypes, South Africa, former Transvaal and former Cape Province, no localities, in MHNG and ZMHB); Dalla Torre 1897: 503 (in catalogue of world Hymenoptera); Arnold 1929: 332, figs 4, 4a–c, ♂, ♀ (in revision of southern African Sphecidae); Arnold 1930: 21 (in checklist of Afrotropical Sphecidae).

Bembix bubalus Handlirsch, R. Bohart and Menke 1976: 545 (in checklist of world Sphecidae); Gess and Gess 1989: 151–160, figs 1, 2, 3, 4, 5, 6 (flower visiting, nesting, first case of nest sharing in *Bembix*, prey capture, prey); De Melo 2000: 105 (use of one nest by more than one female); Evans and O’Neil 2007: 183 (summary of information on nesting habits); Pulawski 2013: 16 (in catalogue of world Sphecidae sensu lato).

Note. Described by Handlirsch from three males and two females from South Africa: “Transvaal (Coll. Saussure) und Cap (Mus. Berolin. et Coll. Saussure)“. Arnold recorded it from Willowmore.

Material examined. SOUTH AFRICA: NORTHERN CAPE: N. Namaqualand, Lekkersing [29.00S, 17.00E], iii.1935 (Museum Staff) [A.J. Hesse et al.], 2 ♀♀ [SAMC]; Fraserburg [31.55S, 21.30E], 24.xii.1972 (Empey), 1 ♂ [AMGS]. WESTERN CAPE: Oudtshoorn, Onverwacht (33.38S, 22.14E), 9–12.xii.1986 (F.W., H.W. and R.W. Gess), 77 ♀♀, 18 ♂♂ (8 ♀♀, 4 ♂♂ on flowers of *Acacia karroo* Hayne; 14 ♂♂ on flowers of *Acacia caffra* (Thunb.) Willd. (both Fabaceae, Mimosoideae); 1 ♀ on flowers of *Zygophyllum retrofractum* Thunb. (Zygophyllaceae); 25 ♀♀ with prey: Syrphidae (*Eristalis tenax* (L.), *Eristalodes taeniops* (Wied.)); Bombyliidae (*Bombylius ornatus* Wied., *Systoechus* spp. and others); Tabanidae and Stratiomyidae) [AMGS]; Olifants River between Citrusdal and Clanwilliam, x–xi.1931 (Museum Staff) [A.J. Hesse et al.], 2 ♂♂ [SAMC]; Upper Sources Olifants River, Ceres [circa 33.05S, 19.14E], xii.1949 (Mus. Exp.) [A.J. Hesse et al.], 1 ♂ [SAMC]; Touwsrivier [33.20S, 20.02E], 9.i.1975 (Empey), 1 ♀ [AMGS]; Merweville Distr. [32.40S, 21.31E], i–ii.1947 (H. Zinn), 1 ♀ [SAMC]; Spitzkop, Laingsburg Dist. [33.3S, 20.35E], iii.1938 (Mus. Staff) [A.J. Hesse et al.], 2 ♀♀ [SAMC]; Moordenaars Karroo, Laingsburg Div. [circa 32.58S, 20.49E], iii.1937 (Mus. Staff) [A.J. Hesse et al.], 2 ♀♀ [SAMC]; Rooinek [Pass], Laingsburg Distr. [33.20S, 20.52E], i.1949 (Zinn – Hesse Mus. Exp.), 1 ♀ [SAMC]; Murraysburg [31.58S, 23.47E], 2.i.1978 (Empey), 1 ♀, 2 ♂♂ [AMGS]; Rietbron [32.54S, 23.08E], 13.i.1965 (H.N. Empey), 1 ♂ [AMGS]. EASTERN CAPE: Mountain Zebra Park (32.15S, 25.27E), 12–16.ii.1988 (A.J. Weaving), 2 ♀♀ [AMGS]; Willowmore [33.15S, 23.30E], ii.1913 (Brauns), 2 ♀♀ [SAMC ex NMBZ; DMSA]; same locality and collector, 1.xii.1919, 1 ♀ [SAMC ex NMBZ]; same locality and collector, 10.xii.1919 (Brauns), 1 ♂ [AMGS]; same locality and collector, 18.

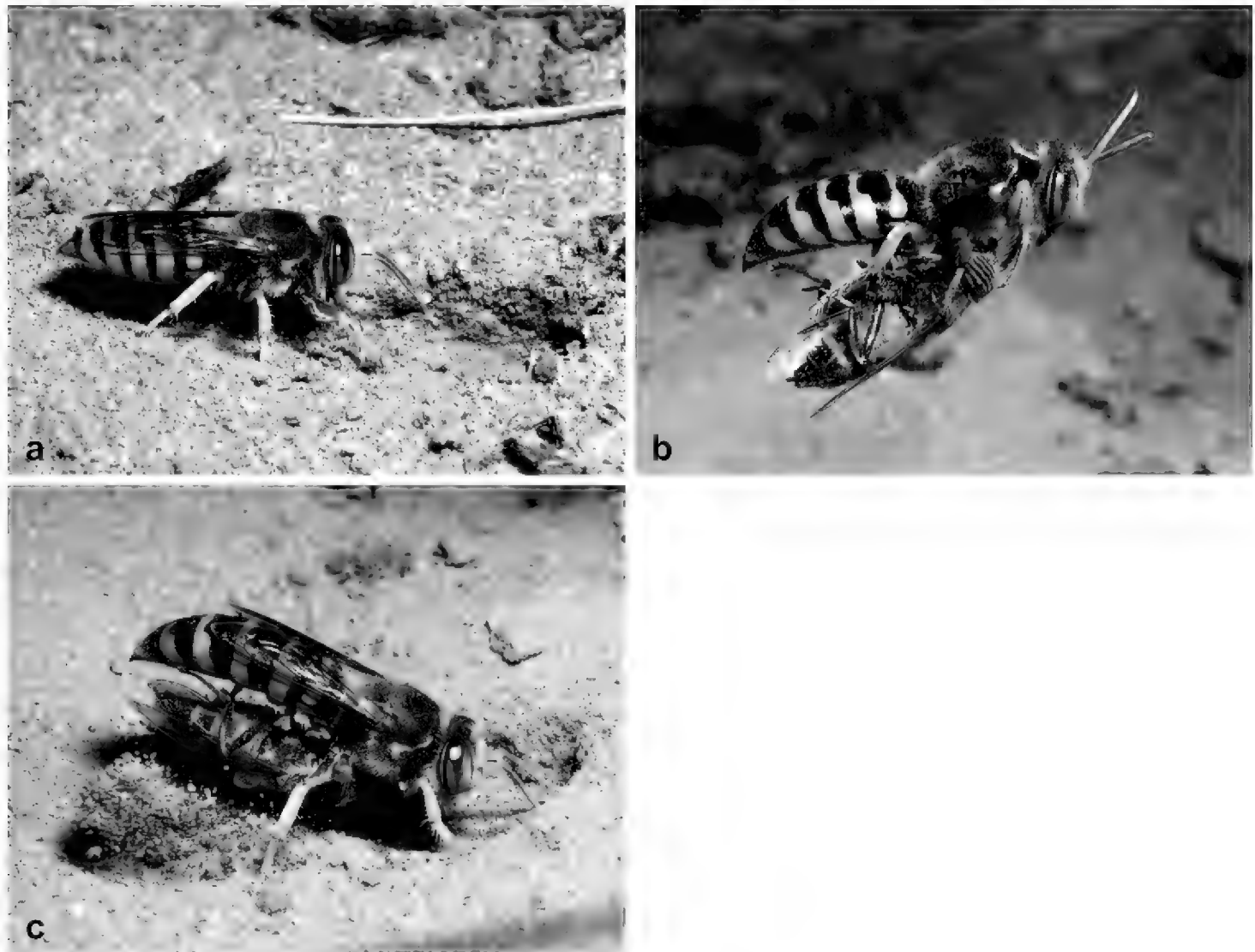


Figure 4. *Bembix bubalus*: **a** raking sand back from nest entrance during nest excavation **b** carrying syrphid prey, coming in to land at nest entrance; holding syrphid prey whilst clearing temporary closure from nest entrance preparatory to entering.

xii.1919, 1 ♂ [SAMC ex NMBZ]; same locality and collector, 20.xii.1920, 1 ♀ [AMGS]; same locality and collector, 3.i.1926, 1 ♀ [AMGS]; same locality, 12.i.1965 (H.N. Empey), 5 ♀♀, 2 ♂♂ [AMGS]; Kingwilliamstown [circa 32.53S, 27.24E], 16.i.1965 (H.N. Empey), 1 ♂ [AMGS].

Geographical distribution. This species appears to have a southern distribution in the Succulent Karoo and southern Nama-Karoo with one outlying record from Kingwilliamstown to the east of the Nama-Karoo (Fig. 7a). The record for a syntype from the “Transvaal” seems questionable.

Flower associations. Recorded from two plant families: Fabaceae (Mimosoideae, *Acacia karroo* Hayne. and *A. caffra* (Thunb.) Willd.) (both Fabaceae: Mimosoideae; Zygophyllaceae (*Zygophyllum retrofractum* Wied.).

Nesting. Nesting in large aggregations of up to 1,000 or more nests in level friable soil, nest multicellular, sloping burrow in friable soil, the main shaft terminating in a spur, provisioning progressive. Notable for exhibiting nest sharing.

Prey. Recorded taking seven families of Diptera: Stratiomyidae, Tabanidae, Syrphidae, Bombyliidae, Muscidae, Sarcophagidae, and Tachinidae.

***Bembix cameronis* Handlirsch**http://species-id.net/wiki/Bembix_cameronis

Fig. 6b

Bembex Cameronis Handlirsch, 1893: 715, pl. 1, fig. 6, pl. 4, fig. 7, pl. 6, fig. 4, ♂, ♀ (Syntypes, South Africa, in ZMHB, NMW); Dalla Torre 1897: 503 (in catalog of world Hymenoptera as *cameronii*); Arnold 1929: 329, figs. 1, 1a-f, pl. 6, fig. 34; Arnold 1930: 21 (in checklist of Afrotropical Sphecidae).

Bembix cameronis Handlirsch, R. Bohart and Menke 1976: 545 (in checklist of world Sphecidae); Gess 1981: 21 (nesting); Gess 1986: 152, 157 (nesting, flowers visited, prey); Gess and Gess 1994: 100 (flower visiting); S. Gess 1996: 276, 280, 281, 283, 295 (flower visiting records); Gess and Gess 2003: 122 (flower visiting records); Evans and O'Neil 2007: 185 (summary of prey records); Pulawski 2013: 17 (in catalogue of world Sphecidae sensu lato).

Note. Described by Handlirsch from a male and a female from the Cape ("Cap") (Berlin Museum) and a female from "Südafrika" (P. Cameron). Arnold (1929) examined and figured a male in the South African Museum from Tradouw Pass, Swellendam (Western Cape).

The specimens examined (FWG) from Lesotho differ from those from the "Cape Province" and from the description of the species (based on Cape material) in being melanistic (i.e. in having the extent of the yellow markings reduced). Most noticeable in this respect is: scape in male entirely black (except radicle and extreme apex), in female with upper surface marked with black streaks; labrum usually with large black streaks on basal two-thirds; clypeus in male black except for a wide apical band somewhat expanded basally in midline, in female with a pair of black spots at base and sometimes a smaller pair on disc (these spots sometimes fused); yellow region on lower face between antennal sockets reduced and inner orbital bands shortened; pronotum with posterior margin black or with only a very narrow yellow band, in male with sides almost entirely black (except for small yellow area on anterior-ventral region of mesopleura), in female with yellow markings mostly present but much reduced; sterna with amount of yellow reduced; black markings on legs more extensive.

Material examined. NAMIBIA: N of Kalkveld on road to Otjiwarongo (20.50S, 16.13E), 25.iii.1997 (F.W. and S.K. Gess), 1 ♀ (visiting deep pink flowers of *Hermestaedtia* sp., Amaranthaceae) [AMGS]; Nomtsas (24.25S, 16.51E), 18.iii.1997 (F.W. and S.K. Gess), 1 ♀ (visiting white flowers of *Limeum argute-carinatum* Wawra & Peyr., Molluginaceae) [AMGS]. SOUTH AFRICA: WESTERN CAPE: 31.5 km from Clanwilliam on road (R363) to Klawer [31.56S, 18.44E], 9–10.x.1990 (F.W. and S.K. Gess), 2 ♀♀, 1 ♂ (on yellow flowers of *Athanasia trifurcata* (L.) L., Asteraceae) [AMGS]; Bul[s]hoek, Klawer – Clanw[illiam] [32.00S, 18.47E], x.1950 (Mus. Exp.) [A.J. Hesse et al.], 1 ♂ [SAMC]; 18.5 km from Clanwilliam on road (R363) to Klawer [32.01S, 18.49E], 9.x.1990 (F.W. and S.K. Gess), 1 ♂ (on yellow flowers of *Aspalathus pulicifolia* (Dahlgren), (Fabaceae: Papilionoideae)

[AMGS]; 17.5 km from Clanwilliam on road (R363) to Klawer [32.01S, 18.49E], 9.x.1990 (F.W. and S.K. Gess), 4 ♀♀ (on yellow flowers of *Athanasia trifurcata* (L.) L., Asteraceae) [AMGS]; 16.5 km from Clanwilliam on old road [R363] to Klawer [32.02S, 18.49E], 13.x.1990 (F.W. and S.K. Gess), 2 ♀♀ [AMGS]; 12.5 km from Clanwilliam on road (R363) to Klawer [32.05S, 18.50E], 9.x.1990 (F.W. and S.K. Gess), 1 ♀ (on yellow flowers of *Athanasia trifurcata* (L.) L., Asteraceae) [AMGS]; Clanwilliam Dam, Caleta Cove (32.14S, 18.56E), 19–20.x.1989 (D.W. Gess), 1 ♂ (visiting flowers of *Athanasia trifurcata* (L.) L., Asteraceae) [AMGS]; 10 km from Clanwilliam on old road to Citrusdal [32.15S, 18.57E], 6.x.1991 (D.W. Gess), 8 ♂♂ (on yellow flowers of *Pteronia divaricata* Less, Asteraceae) [AMGS]; Clanwilliam Dam, E bank, 19.2 km S of caravan park (32.17S, 18.56E), 5.x.1995 (F.W., S.K. and R.W. Gess), 3 ♂♂ (on ground) [AMGS]; Clanwilliam Dam, E bank, 20 km S of caravan park (32.17S, 18.56E), 3.x.1997 (F.W. and S.K. Gess), 1 ♂ [AMGS]; Graafwater District, Heerenlogement (31.58S, 18.33E), 8.x.1955 (F.W., S.K. and R.W. Gess), 1 ♂ (visiting pink flowers of *Psilocaulon* spp., Aizoaceae: Mesembryanthema) [AMGS]; between Klipfontein and Olaf Bergfontein (32.02S, 18.33E), 1 ♀, 2 ♂♂ (visiting pale pink flowers of *Psilocaulon acutisepalum* (Berger) N.E. Br., Aizoaceae: Mesembryanthema) [AMGS]; Graafwater (32.09S, 18.33E), 14.x.1994 (F.W. and S.K. Gess), 1 ♂ (on pink flowers of *Psilocaulon* sp., Aizoaceae: Mesembryanthema) [AMGS]; Clanwilliam District, Kransvlei (32.14S, 18.51E), 7–13.x.1987 (F.W. and S.K. Gess), 2 ♀♀, 3 ♂♂ (1 ♀ stylopized; 1 ♂ on flowers of *Athanasia trifurcata* (L.) L., Asteraceae) [AMGS]; Paleisheuvel [32.29S, 18.44E], xi.1948 (Mus. Exp.) [A.J. Hesse et al.], 3 ♀♀ 3 ♂♂ [SAMC]; Citrusdal Dist. [circa 32.33S, 19.01E], xi.1948 (Mus. Exp.) [A.J. Hesse et al.], 1 ♂ [SAMC]; Upper Sources Olifants River, Ceres [circa 33.05S, 19.14E], xii.1949 (Mus. Exp.) [A.J. Hesse et al.], 1 ♀ [SAMC]; 43 km ENE of Ceres on road to Sutherland [33.12S, 19.44E], 2–3.xii.1989 (F.W. and S. K. Gess), 1 ♀ (on flowers of *Limonium* sp., Plumbaginaceae) [AMGS]; Gouph, Laingsburg Dist. [circa 33.12S, 20.52E], ix.1937 (Mus. Staff) [A.J. Hesse et al.], 1 ♀ [SAMC]; 17 km N of Ceres near top of Gydo Pass [33.14S, 19.20E], 30.xi.1989 (F.W. and S.K. Gess), 1 ♂ [AMGS]; Leipoldtville – Eland's Bay [32.13S, 18.29E – 32.18S, 18.21E], xi.1948 (Mus. Exp.) [A.J. Hesse et al.], 1 ♀, 6 ♂♂ [SAMC]; Constable [33.16S, 20.17E], xii.1962 (S.A.M.) [A.J. Hesse et al.], 1 ♀ [SAMC]; Matroosberg Station [33.24S, 19.48E], 12.i.1962 (SAMC) [A.J. Hesse et al.], 1 ♂ [SAMC]; circa 2 km S of Matroosberg Station (33.26S, 19.50E), 4.xii.1986 (H.W. Gess), 1 ♀ (on white flowers of “mesem”, Aizoaceae: Mesembryanthema) [AMGS]; road between Montagu and Matroosberg Station (circa 33.32S, 19.52E), 4.xii.1986 (F.W., S.K. and H.W. Gess), 3 ♀♀, 1 ♂ (2 ♀♀, 1 ♂ on white flowers of “mesem”, Aizoaceae: Mesembryanthema) [AMGS]; Ouberg Pass, by road 27 km NE of Montagu (33.40S, 20.16E), 3.xii.1986 (S.K. Gess), 1 ♂ [AMGS]; Oudtshoorn, Frischgewaagd (33.39S, 22.13E), 7–8.xii.1986 (F.W. and S.K. Gess), 2 ♀♀, 1 ♂ (1 ♀, 1 ♂ on flowers of *Senecio rosmarinifolius* L.f., Asteraceae) [AMGS]; Raubenheimer Dam near Oudtshoorn [33.41S, 24.43E], 10.x.1972 (C.F. Jacot-Guillarmod), 1 ♂ [AMGS]; Oudtshoorn, Zebra [33.46S, 22.19E], x.1951 (Mus. Expd) [A.J. Hesse et al.], 1 ♀ [SAMC];

near Danger Point, Gansbaai (34.37S, 19.20E), 18.xi.2012 (D.W. and G.M. Gess), 3 ♂♂ (2 ♂♂ on *Muraltia satureioides* DC., Polygalaceae; 1 ♂ on ground amongst same) [AMGS]; Pearly Beach, Bredasdorp [34.39S, 19.29E], xii.1958 (SAMC.) [A.J. Hesse et al.], 1 ♀ [SAMC]; Pearly Beach, 25.i.1971 (M.W. Strydom), 1 ♀ [SANC]; EASTERN CAPE; Kranzdrif, Grahamstown [33.09S, 26.32E], 5.xi.1947 (C. Jacot-Guillarmod), 1 ♀; near Lake Mentz [now Darlington Dam] [circa 33.12S, 25.09], 7.xi.1973 (R. Bayliss), 1 ♀; Hilton, Grahamstown [33.15S, 26.20E], 19.xi.1967 (C. Jacot-Guillarmod), 1 ♂; same locality, 25.i.1974 (D.W. Gess), 1 ♀, 3.xi.1977 (F.W. Gess), 1 ♀ (on flowers of *Lasiospermum bipinnatum* (Thunb.) Druce, Asteraceae), 12.i.1978 (H.W. Gess), 1 ♀, 29.xi.1979 (F.W. Gess), 3 ♀♀, 3 ♂♂ (on flowers of *Senecio pterophorus* DC., Asteraceae), 29–30. xi.1979 (F.W. Gess), 2 ♂♂ (Malaise trap), 1.xii.1979 (F.W. and S.K. Gess), 2 ♀♀ (on flowers of *Senecio pterophorus* DC., Asteraceae), 2.xii.79 (F.W. and S.K. Gess), 2 ♀♀, 4 ♂♂ (2 ♀♀, 3 ♂♂ on flowers of *Senecio pterophorus* DC., Asteraceae, 1 ♂ on flowers of *Athanasia filiformis* L.f., Asteraceae), 5–7.xii. 1979 (F.W. Gess), 2 ♀♀ (Malaise trap), 11–16.xii.1979 (F.W. Gess), 1 ♀ (Malaise trap), 16–22.xii.1979 (F.W. Gess), 1 ♀ (Malaise trap), 4.xi.1982 (F.W. and S.K. Gess), 1 ♂, 14.xii.1982 (D.W. Gess), 1 ♀, 28.xi.1983 (D.W. Gess), 1 ♂, 1.xii.1983 (F.W. and S.K. Gess), 1 ♀, 6.xi.1984 (A.J. Weaving), 1 ♂; Burnt Kraal, Grahamstown [33.16S, 26.29E], 12.ii.1969 (F.W. Gess), 1 ♀ [all AMGS]. NORTHERN CAPE: Nieuwoudtville, Skuinshoogte Pass (31.16S, 19.08E), 23–30.ix.1994 (F.W. and S.K. Gess), 1 ♂ (buzzing around white flowered “mesem”, Aizoaceae: Mesembryanthema) [AMGS]; Namaqualand, Springbok, Hester Malan [now Goegap] Nature Reserve [29.38S, 17.59E], 15–21.x.1987 (F.W. and S.K. Gess), 1 ♂ (Malaise trap) [AMGS]; 15 km N [of] Nieuwoudtville on road to Loeriesfontein [31.16S, 19.E], 3–8.x.1989 (F.W. and S.K. Gess), 1 ♀ [AMGS]; Namaqualand, Bowesdorp [30.20S, 17.56E], xi.1931 (Museum Staff), 2 ♂♂ [SAMC]. LESOTHO: Makhaleng River, Mountain Road [AMGS], 3.i.1959 (C. Jacot-Guillarmod), 2 ♀♀, 1 ♂ [AMGS]; Mahlatsa [29.13S, 28.00E], 12.i.1948 (A. Jacot-Guillarmod), 1 ♀ [AMGS]; Bokong P.O. [29.17S, 28.23E], 26.xii.1946 (A. Jacot-Guillarmod), 1 ♀ (with prey: Bombyliidae) [AMGS].

Geographical distribution. Namibia, Nama-Karoo, south through the Succulent Karoo and eastwards through the Nama-Karoo of South Africa into Lesotho (Fig. 7b).

Floral associations. Recorded from seven plant families: Asteraceae (*Athanasia trifurcata* (L.) L., *A. filiformis* L. f., *Senecio rosmarinifolius* L.f., *S. pterophorus* DC., *Lasiospermum bipinnatum* (Thunb.) Druce and *Pteronia divaricata* Less); Amaranthaceae (*Hermbstaedtia* sp.); Molluginaceae (*Limeum argute-carinatum* Wawra & Peyr.); Aizoaceae (Mesembryanthema, *Psilocaulon* spp. and “mesems”), Polygalaceae (*Muraltia satureioides* DC.); Fabaceae (Papilionoideae, *Aspalathus pulicifolia* (Dahlgren)); Plumbaginaceae (*Limonium* sp.).

Nesting. Single nest investigated - a single celled, sloping burrow in friable soil. The main shaft terminated in a spur.

Prey. Recorded taking one family of Diptera: Bombyliidae (*Systoechus* sp.), from two well separated sites, Hilton, Eastern Cape, South Africa and Bokong, Lesotho.

***Bembix capensis* Lepeletier**

http://species-id.net/wiki/Bembix_capensis

Fig. 6c

Bembex capensis Lepeletier, 1845: 273, ♂ (Holotype, ♂, no locality, South Africa, former Cape Province, in collection M. Spinola, Turin, Italy); F. Smith 1856: 322 (in catalogue of Hymenoptera in British Museum); Dalla Torre 1897: 503 (in catalogue of world Hymenoptera); Handlirsch 1893: 853, pl. 3, figs 4, 26, ♂, ♀ (in revision of world Bembicinae); Cameron 1910: 144; Arnold 1929: 377, figs 40, 40a–c, pl. 6, fig. 32, ♂, ♀ (in revision of southern African Sphecidae); Arnold 1930: 21 (in checklist of Afrotropical Sphecidae); Arnold 1935: 503 (Kalahari, South Africa); Gadallah 2002: 63 (in key to Egyptian *Bembix* based on male genitalia).

Bembix capensis Lepeletier, J. Parker 1929: 143 (in revision of Stizini and Bembicini); de Beaumont 1967: 506 (Natal [KwaZulu-Natal], South Africa); Carpenter 1920 (prey); Ulleyt and De Vries 1940 (prey); R. Bohart and Menke 1976: 545 (in checklist of world Sphecidae); Gess and Gess 1994: 100 (flower visiting); Gess 1981: 21 (prey) Gess 1986: 152, 157 (prey); S. Gess 1996: 276, 280, 281, 283, 295 (flower visiting records); Guichard 1989: 146 (Saudi Arabia); Gadallah 1997: 259 (in revision of Egyptian *Bembix*); Gess and Gess 2003: 122 (flower visiting records); Gadallah and Assery 2004: 230 (in checklist of Sphecidae of Saudi Arabia); Roche 2007a: 109 (in checklist of Egyptian Ampulicidae, Sphecidae and Crabronidae, redescription); Roche 2007b: 7 (in checklist of Egyptian Ampulicidae, Sphecidae and Crabronidae); Pulawski 2013: 17 (in catalog of world Sphecidae sensu lato).

Bembex natalis Dahlbom, 1845: 489, ♀ (Holotype or syntypes, South Africa, Port Natal [Durban, KwaZulu-Natal], in Lund or Stockholm). Handlirsch 1893: 853, synonymised with *B. capensis*; F. Smith 1856: 324 (in catalogue of Hymenoptera in British Museum).

Note. Described by Lepeletier (1845) from the Cape of Good Hope and subsequently recorded from various parts of southern Africa: Handlirsch (1893) from the Transvaal and “Capland”; Cameron (1910) from Olifants River (Transvaal); and Parker (1929) from South West Africa (now Namibia). Arnold (1929) stated it to be “a common species widely distributed throughout Rhodesia (now Zimbabwe) and South Africa”, and (1935) recorded it from three localities (Gemsbok Pan, Gomodimo and Ngami) in the Kalahari (Botswana). De Beaumont (1967) recorded it from Tugela River, 12 miles WNW Bergville, Natal (now KwaZulu Natal).

Material examined. TANZANIA: Old Shinyanga [3.34S, 33.24E], 18.vii.1954 (E. Burtt), 1 ♀ (with cocoon) [SAMC ex NMBZ]. ZIMBABWE: Sawmills [19.35S, 28.02E], 26.x.1919 (G. Arnold), 1 ♂ [AMGS]; Sawmills [19.35S, 28.02E], 12.xi.1920 (Rhodesia Museum), 1 ♂ [SAMC ex NMBZ]; Sawmills, 1.iv.1923 (Roy Stevenson), 1 ♂ [SAMC ex NMBZ]; Sawmills, 16.xi.1924 (Rhod. Museum), 1 ♀ [SAMC ex NMBZ]; Sawmills R[oa]d, Nyamandhlovu [circa 19.52S, 28.15E],

26.iii.1961 (Nat. Museum S. Rhodesia), 1 ♀ [SAMC ex NMBZ]; Nyamandhlovu [19.52S, 28.15E], xi.1960 (Nat. Museum S. Rhodesia), 1 ♂ [SAMC ex NMBZ]; Bulawayo [20.07S, 28.32E], xi.1912 (G. Arnold), 1 ♀ [AMGS]; Bulawayo, 7. ix.1913 (G. Arnold), 1 ♀ [SAMC ex NMBZ]; Bulawayo, 29.ix.1923 (R. Stevenson), 2 ♂♂ [AMGS]; Bulawayo, 1.x.1923 (R. Stevenson), 1 ♂ [SAMC ex NMBZ]; Bulawayo, 17.iii.1924 (R.H.R. Stevenson), 1 ♂ [AMGS]; Bulawayo, 5.x.1924 (Rhodesia Museum), 1 ♀ [SAMC ex NMBZ]; Bulawayo, 26.xii.1951 (Nat. Museum S. Rhodesia), 1 ♂ [SAMC ex NMBZ]; Gwaai [= Gwai] [19.17S, 27.43E], 14.x.1926 (R.H.R. Stevenson), 1 ♀ [AMGS]; Turk Mine [19.44S, 28.48E], 24.xi.1957 (Nat. Museum S. Rhodesia), 1 ♀ [SAMC ex NMBZ]; Turk Mine, 16.xii.1957 (Nat. Museum S. Rhodesia), 1 ♂ [AMGS]; Turk Mine, 2.xi.1958 (Nat. Museum S. Rhodesia), 2 ♂♂ [1 ♂ AMGS; 1 ♂ SAMC ex NMBZ]; Turk Mine, 1.xi.1959 (Nat. Museum S. R.), 1 ♀ [SAMC ex NMBZ]; Turk Mine, i.1961 (Nat. Museum S. R.), 1 ♂ [SAMC ex NMBZ]; Hillside [20.12S, 28.37E], 1.xii.1922 (Swinburne and Stevenson), 1 ♂ [SAMC ex NMBZ]; Hillside [20.12S, 28.37E], 6.v.1924 (R.H.R. Stevenson), 1 ♂ [AMGS]; Umguza R[iver] [19.42S, 28.25E], 24.x.1930 (R.H.R. Stevenson), 1 ♀ [AMGS]; ia (28.06S, 32.26E), 4–5.iii.1987 (A.J. Weaving), 1 ♂ [AMGS]. NAMIBIA: Gautsche Pan, Bushmanland (19.48S, 20.35E), 9–13.vi.1971 (no collector given), 2 ♀♀ [NMNW]; Noachabeb 97, Keetmanshoop [SE 2718 Ad] [27.26S, 18.31E], 7–12.i.1972 (no collector given), 2 ♀♀ [NMNW]; Oshakati, Ovamboland (SE 2715 Da) [17 48S, 15.42E], 5.v.1971 (no collector given), 1 ♀; Claratal 18 (SE 2216 Dd) [22 48S, 16.50E], Windhoek, 27.i.1971 (no collector given), 1 ♀ [NMNW]; Otjikoko-Süd (SE 2116 Ad) [21.22S, 16 22E], Omaruru, 18.xi.1971 (no collector given), 2 ♀♀ [NMNW]; Takuasa (SE 1720 Cd), Kavango, 14–19.vii.1971 (no collector given), 1 ♀ [NMNW]; 30 km E [of] Karasburg on road from Ariamsvlei (28.00S, 19.03E), 12.iii.1997 (F.W. and S.K. Gess), 1 ♀ (visiting yellow flowers of *Geigeria* sp., Asteraceae) [AMGS]; Great Karas Mountains [circa 27.11S, 18.44E], xi.1936 (Mus. Staff), 6 ♀♀ [SAMC]; Ongandjera [17.55S, 15.05E], iii.1923 (S. W. Africa Mus. Exped.), 2 ♂♂ [SAMC]; Windhoek [22.35S, 17.04E], no date, no collector recorded), 1 ♀ [SAMC]; Swakop River Bed on road to Goanikontes (22.41S, 14.35E), 11.iv.1998 (F.W. and S.K. Gess), 10 ♀♀, 6 ♂♂ visiting white flowers of *Psilocaulon salicornioides* (Pax) Schwantes, Aizoaceae: Mesembryanthema) [AMGS]; Swakop River at bridge nr mouth (22.42S, 14.32E), 12.iv.1998 (F.W. and S.K. Gess), 1 ♀ (on moist sand) [AMGS]; Swakopmund, Swakop R[iver] at bridge (22.42S, 14.32E), 16.iii.1999 (F.W. and S.K. Gess), 1 ♀ [AMGS]; 18 km west of 1237/C26 junction (23.09S, 16.42E), 1 ♂ (visiting deep-pink flowers of *Hermstaedtia* sp., Amaranthaceae) [AMGS]; Gamsberg, E of Pass (23.19S, 16.31E), 12.iii.1999 (F.W. and S.K. Gess), 1 ♂ visiting yellow flowers of *Geigeria* sp., Asteraceae) [AMGS]; Namutoni [18.48S, 16.59E], 1919 (J. Breyer), 1 ♂ [AMGS]. LESOTHO: Mamathes [29.08S, 27.51E], 18. xi.1945 (L. Bevis), 1 ♂ [AMGS]; Mamathes [29.08S, 27.51E], 9.xi.1947 (C. Jacot-Guillarmod), 1 ♂ [AMGS]; same locality and collector, 8.xi.1949, 2 ♂♂, 12.xi.1949, 1 ♂, 13.xi.1949, 3 ♂♂, 17.xi.1949, 1 ♂, 18.xi.1949, 1 ♂, 18.xii.1949, 1 ♀, 29.i.1950, 1 ♀, 14.xi.1954,

1 ♀ [all 11 AMGS]; nr. Medicani [??], 20.i.1939 (L. Bevis), 1 ♀ [AMGS]. SOUTH AFRICA: GAUTENG: Pretoria North [25.40S, 28.10E], 17.x. 1947 (C. Jacot-Guillarmod), 3 ♀♀, 1 ♂ [AMGS]; Pretoria North [25.40S, 28.10E], 19.x.1947 (C. Jacot-Guillarmod), 1 ♀ [AMGS]; Pretoria North [25.40S, 28.10E], 29.xi.1964 (Empey), 1 ♂ [AMGS]; Pretoria North Sandpits [25.40S, 28.15E], 25.x.1947 (C. Jacot-Guillarmod), 1 ♀ (with prey: Sarcophagidae); Pretoria North Sandpits, 26.x.1947 (C. Jacot-Guillarmod), 2 ♂♂ (bearing pollinia of Asclepiadaceae on tarsi) [AMGS]; Johannesburg [26.10S, 28.02E], 9.ii.1967 (J.G.H. Londt), 2 ♀♀, 1 ♂ [AMGS]; Johannesburg North, Raedene [26.09S, 28.06E], 28.iii.1966 (Empey), 4 ♀♀, 2 ♂♂ [AMGS]; Johannesburg North, Raedene, 21.v.1966 (Empey), 3 ♀♀ [AMGS]; Johannesburg North, Wilds [26.09S, 28.3E], 17.iii.1962 (Empey), 1 ♀ [AMGS]; Johannesburg East [circa 26.12S, 28.3E], 4.xii.1961 (Empey), 1 ♀ [AMGS]; Johannesburg West [26.12S, 28.3E], 6.i.1958 (Empey), 1 ♀ [AMGS]; Johannesburg West, 4.i.1959 (Empey), 1 ♀ [AMGS]; Johannesburg West, 3.ii.1959 (Empey), 1 ♂ [AMGS]; Johannesburg West, 4.xii.1961 (Empey), 3 ♀♀, 1 ♂♂ [AMGS]; Johannesburg West, 30.x.1966 (Empey), 1 ♂ [AMGS]; Florida Hills [26.10S, 27.52E], 19.iii.1960 (Empey), 1 ♀ [AMGS]; Florida Hills, 26.ii.1961 (Empey), 1 ♀ [AMGS]; Florida Hills, 2.iv.1961 (Empey), 2 ♀♀ [AMGS]; Florida Hills, 25.ii.1968 (F.J. Herbst), 1 ♂ [AMGS]; Strubens Valley, Florida [26.10S, 27.56E], 14.xi.1965 (Empey), 1 ♀ [AMGS]; Strubens Valley, Florida, 29.xi.1965 (Empey), 1 ♀ [AMGS]; Strubens Valley, Florida, 6.xii.1969 (Empey), 1 ♀ [AMGS]; Strubens Valley, Florida, 21.xii.1969 (Empey), 1 ♀ [AMGS]; Mondeor Hills [26.16S, 28.0E], 6.i.1958 (Empey), 1 ♂ [AMGS]; Mondeor Hills, 6.xii.1961 (Empey), 1 ♀ [AMGS]; Alberton [26.18S, 28.15E], 4.xii.1961 (Empey), 1 ♂ [AMGS]; Alberton [26.18S, 28.15E], 28.i.1966 (Empey), 1 ♀ [AMGS]; Benoni [26.11S, 28.18E], 28.xi.1964 (Empey), 1 ♀ [AMGS]; Mid-West Transvaal, Midway Station [26.43S, 27.06E], 29.iv.1963 (Empey), 3 ♀♀ [AMGS]. NORTH WEST PROVINCE: Pienaarsrivier [25.10S, 27.59E], 2.xi.1967 (Empey), 2 ♀♀ [AMGS]; Schweitzer-Reneke [27.11S, 25.18E], 27.ii.1979 (F. Herbst), 1 ♂ [AMGS]; MPUMALANGA: Nelspruit [25.29S, 30.59E], 15.x.1967 (Empey), 1 ♀ [AMGS]; Maboki, Lydenburg [circa 25.10S, 30.29E], no date (F.J. Kroeger), 1 ♀ [SAMC]; Skukuza [24.59S, 31.36E], 6.ii.1965 (D.J. Brothers), 1 ♂ [AMGS]. KWAZULU-NATAL: Sordwana Bay [now Sodwana Bay] [27.32S, 32.41E], 27.iv.1977 (F.J. Herbst), 1 ♂ [AMGS]; Dundee [28.11S, 30.15E], 21.i.1961 (Empey), 2 ♂♂ [AMGS]; Nagle Dam District [29.35S, 30.37E], 16.i.1966 (F. Herbst), 1 ♂ [AMGS]; Kloof [29.47S, 30.50E], ii.1915 (Marley), 1 ♀ [SAMC]; Ladysmith [28.32S, 29.46E], 26.iii.1960 (Empey), 2 ♀♀ [AMGS]; Mfongosi [28.43S, 30.48E], xii.1934 – ii.1935 (W.E. Jones), 1 ♂ [SAMC]. FREE STATE: Chicago, Lindley Dist. [circa 27.53S, 27.57E], 17–18.i.1968 (D.J. Brothers), 4 ♀♀, 3 ♂♂ [AMGS]; Kroonstad [27.43S, 27.19E], ii.1946 (S. Brothers), 1 ♂ [AMGS]; same locality and collector, v.1946, 1 ♀ [AMGS]; same locality, 29.xi.1946 (C. Jacot-Guillarmod), 1 ♀ [AMGS]; same locality, ii.1948 (D.J. Brothers), 1 ♂ [AMGS]; same locality, 4.iv.1948 (J. Brothers), 1 ♂ [AMGS]; same locality, 22.xii.1964 (D.J. Brothers), 1 ♂ [AMGS];

same locality and collector, xii.1965, 2 ♀♀ [AMGS], 31.xii.1965, 4 ♂♂ [all 6 AMGS]; Flora, Marquard [28.40S, 27.28E], 1.i.1960 (C. Jacot-Guillarmod), 3 ♀♀ [AMGS]; Bloemfontein [29.06S, 27.07E], 10.iii.1931 (Nat. Museum S. Rhodesia), 1 ♂ [AMGS]; same locality, 20.iii.1931 (C. Jacot-Guillarmod), 2 ♂♂ [1 ♂ AMGS; 1 ♂ SAMC ex NMBZ]; Smithfield [30.09S, 26.30E], 1909 (Kannemeyer), 1 ♀ [SAMC]. NORTHERN CAPE: Kalahari Gemsbok National Park, Nossob River bed 11 km NNE [of] Twee Rivieren [26.24S, 20.41E], 8–11.iii.1990 (F.W. and S.K. Gess), 5 ♀♀, 5 ♂♂ (on yellow flowers of *Deverra aphylla* (Cham. & Schlechtd.) DC, Apiaceae) [AMGS]; Namaqualand, Springbok, Hester Malan [now Goegap] Nature Reserve [29.38S, 17.59E], 15–21.x.1987 (F.W. and S. K. Gess), 5 ♂♂ (Malaise trap) [AMGS]; Namaqualand, Bowesdorp [30.20S, 17.18E], xi.1931 (Mus. Staff), 1 ♀, 1 ♂; Namaqualand, Kamiesberg to Sors Sors (30.11S, 18.01E), 9–12.x.1997 (F.W. and S. K. Gess), 4 ♂♂ (visiting blue flowers of *Anchusa capensis* Thunb., Boraginaceae) [AMGS]; Vanwyksfontein, 8 km W. of Norvalspont [30.39S, 25.23E], 15–24.i.1985 (D.W. Gess), 4 ♀♀, 6 ♂♂ (2 ♀♀, 6 ♂♂ on flowering), 4 ♂♂ (3 ♂♂ Malaise trap) [AMGS]; Thee Kloof [32.05S, 20.41E], Fraserburg Div. (*Acacia karroo* Hayne, Fabaceae, Mimosoideae) [AMGS]; same locality, 28–30. xi.1988 (F.W. and S.K. Gess), xi.1935 (Mus. Staff), 1 ♂ [SAMC]; Tanqua Karoo [circa 32.15S, 19.45E], i.1949 (Zinn – Hesse Mus, Exp.), 3 ♀♀, 3 ♂♂ [SAMC]; 26 miles North of Postmasburg [circa 28.18S, 23.05E], 1 ♂ [SAMC]; Sutherland Distr. [circa 32.24S, 20.40E], 8.i.1942 (H. Zinn), 1 ♂ [SAMC]; Richmond District [circa 31.23S, 23.56E], iii.1931 (Museum Staff), 2 ♀♀ [SAMC]; Kimberley [28.43S, 24.46E], ii.1951 (R.C. Bigalke), 2 ♀♀ [AMGS]. WESTERN CAPE: Citrusdal Dist. [circa 32.33S, 19.01E], xi.1948 (Mus. Exp.), 1 ♂; Clanwillium, Rondegat (32.15S, 18.56E), 15.x.1997 (F.W. and S.K. Gess), 1 ♀ (visiting yellow flowers of *Athanasia trifurcata* (L.) L. (Asteraceae) [AMGS]; 31.5 km from Clanwilliam on road (R363) to Klawer [31.56S, 18.44E], 9–10.x.1990 (F.W. and S.K. Gess), 2 ♂♂ (on yellow flowers of *Athanasia trifurcata* (L.) L., Asteraceae) [AMGS]; Prince Albert Dist[ri]ct, Tierberg (Study Site) (33.10S, 22.16E), 26.xi.- 5.xii.1987 (F.W., S.K. and R.W. Gess), 1 ♂ (on flowers of *Gomphocarpus filiformis* (E. Mey.) D. Dietr., Asclepiadaceae) [AMGS]; Prince Albert Dist., Tierberg Farm (33.10S, 22.15E), 21.i.1996 (F.W. and S.K. Gess), 1 ♂ (visiting cream flowers of *Gomphocarpus filiformis* (E. Mey.) D. Dietr., Asclepiadaceae) [AMGS]; Dikbome, Merweville, Koup [32.54S, 21.22E], i.1953 (H. Zinn), 7 ♀♀, 10 ♂♂ [SAMC]; Merweville Dist[ri]ct [32.40S, 21.31E], ii.1948 (H. Zinn), 1 ♀ [SAMC]; Merweville Distr[ic]t [32.40S, 21.31E], ii.1943 (H. Zinn), 1 ♂ [SAMC]; Merweville Dist[ri]ct, i.-ii.1947 (H. Zinn), 1 ♀ [SAMC]; Merweville, Laingsburg Dist. [32.40S, 21.31E], i.1959 (H. Zinn), 1 ♀ [SAMC]; Constable [33.16S, 20.17E], ii.1958 [Mus.Staff], 1 ♀ [SAMC]; Klipberg n[ear] Darling [circa 33.23S, 18.23E], 8.v.1968 (C.G.C. Dickson), 1 ♀ [SAMC ex NMBZ]; Beaufort West Dist[ri]ct [circa 32.18S, 22.36E], ii.1958 (S. A. M. sic [South African Museum]), 3 ♀♀, 5 ♂♂; Plumstead [Cape Town] [34.15S, 18.28E], xi.1942 (A. Banwick), 1 ♂; Cape Town [33.55S, 18.22E], 1909 (Master Péringuey), 1 ♀ [SAMC]; Cape Town [33.55S, 18.22E], 8.xii.1958 (M.S. Thomson), 1 ♀ [AMGS];

Bushmans Riv[er], Letjiesbosch, Koup [32.34S, 22.16E], xi.1935 (Mus. Staff), 1 ♂ [SAMC]; Murraysburg Dist[rikt] [circa 31.58S, 23.47E], iii.1931 (Museum Staff), 6 ♀♀, 5 ♂♂ [SAMC]; Murraysburg [31.58S, 23.47E], xi.1935 (Mus. Staff), 1 ♀, 2 ♂♂ [SAMC]; EASTERN CAPE: Grahamstown [33.19S, 26.31E], iii.1945 (G.H. Frank), 1 ♂ [AMGS]; Grahamstown [33.19S, 26.31E], 22.iii.1958 (E.McC. Callan), 1 ♀ [AMGS]; Hilton farm, Grahamstown [33.15S, 26.20E], 22.x.1967 (C. Jacot-Guillarmod), 1 ♂ [AMGS]; Hilton farm, Grahamstown, 2.i.1974 (D.W. Gess), 1 ♂; Hilton farm, Grahamstown, 6.xii.1977 (D.W. Gess), 2 ♂♂; Hilton farm, Grahamstown, 20.xii.1977 (D.W. Gess), 1 ♀; Hilton farm, Grahamstown, 27.xii.1977 (D.W. Gess), 1 ♀; Hilton farm, Grahamstown, 2.i.1978 (D.W. Gess), 1 ♂; Brak Kloof farm, Grahamstown [33.26S, 26.23E], i.1901 (Mrs G. White), 1 ♂ [AMGS]; Brak Kloof farm, Grahamstown, iii.1901 (Mrs G. White), 1 ♂ [AMGS]; Kasuga (sic) [Kasouga] [33.39S, 26.44E], 25.ix.1958 (R.E. Bolt), 1 ♂ [AMGS]; Bashee [now Mbashe] River [32.13S, 28.54E], 28.ix.1973 (E. Herbst), 1 ♀, 4 ♂♂ [AMGS]; same locality and collector, 12.xii.1975, 3 ♀♀ [AMGS]; Fort Beaufort [32.46S, 26.40E], 20.i.1960 (C. Jacot-Guillarmod), 1 ♀, 3 ♂♂ [AMGS]; Fort Beaufort, Umdala [Mdala] [32.48S, 26.41E], iii.1954 (S. A. Museum), 2 ♀♀, 1 ♂ [SAMC]; Willowmore [28.55S, 18.13E], xi.1908 (Brauns), 1 ♂ [AMGS]; Willowmore, i.1914 (Rhodesia Museum), 1 ♀, 1 ♂ [SAMC ex NMBZ]; Willowmore, xii.1919 (Brauns), 1 ♀ [AMGS]; Middelburg Div. [circa 31.30S, 25.00E], xi.1935 (Mus. Staff), 1 ♂ [SAMC]; Middelburg [31.30S, 25.00E], 3.ii.1957 (E.McC. Callan), 1 ♂ [AMGS]; Burgersdorp [31.00S, 26.20E], 1.v.1952 (N. Gane), 1 ♀ [AMGS]; Alicedale [33.15S, 26.04E], 2.xii.1970 (F.W. Gess), 3 ♂♂ [AMGS]; same locality and date (J.G.H. Londt), 1 ♀, 2 ♂♂ [AGM]; Alicedale, New Year's Dam [33.15S, 26.04E], 16.xii.1971 (F.W. Gess), 1 ♀ [AMGS]; Resolution farm, Fort Brown [33.08S, 26.37E], 24.i.1928 (Miss Walton), 1 ♂ [AMGS]; Resolution farm, Fort Brown, 29.i.1928 (Miss Walton), 1 ♂ [AMGS]; Resolution farm, Fort Brown, 8.ii.1928 (Miss Walton), 1 ♂ [AMGS]; Resolution farm, Fort Brown, 29.ii.1928 (A. Walton), 1 ♀ [AMGS]; Dunbrody [33.28S, 25.33E], xii.1917 (V. Powles), 1 ♀ [AMGS]; Pluto's Vale [33.14S, 26.40E], Grahamstown, 8.xi.1964 (C. Jacot-Guillarmod), 1 ♀ [AMGS]; Port Elizabeth [33.58S, 25.40E], i.1952 (B.R. Stuckenberg), 2 ♀♀ [AMGS].

Geographical distribution. A widespread species from Egypt southwards to the south coast of South Africa (Fig. 7c).

Flower associations. Recorded from seven plant families: Asteraceae (*Geigeria* sp. and *Athanasia trifurcata* (L.) L.); Aizoaceae (*Mesembryanthema*, *Psilocaulon salicornioides* (Pax) Schwantes); Amaranthaceae (*Hermstaedtia* sp.); Apiaceae (*Deverra aphylla* (Cham. & Schlecht.) DC); Fabaceae (*Mimosa* spp., *Acacia karroo* Hayne); Boraginaceae (*Anchusa capensis* Thunb.); Apocynaceae (formerly Asclepiadaceae, *Gomphocarpus filiformis* (E. Mey.) D. Dietr.).

Nesting. Unknown.

Prey. Recorded taking six families of Diptera: Sarcophagidae, Tabanidae, Glossinidae, Calliphoridae, and Tachinidae.

***Bembix capicola* Handlirsch**http://species-id.net/wiki/Bembix_capicola

Fig. 6d

Bembex capicola Handlirsch, 1893: 814, pl. 2, fig. 19, pl. 5, fig. 25, pl. 7, fig. 10, ♂ (Syntypes, South Africa, former Cape Province and “Kafferland”, in NMW, ZMHB); Dalla Torre 1897: 503 (in catalogue of world Hymenoptera); Arnold 1929: 360, figs 25, 25a, 25b, pl. 6, figs 20, 21, ♂, ♀ (in revision of the southern African Sphecidae); Arnold 1930: 21 (in checklist of Afrotropical Sphecidae).

Bembix capicola Handlirsch, Ulyett and De Vries 1940 (prey); R. Bohart and Menke 1976: 545 (in checklist of world Sphecidae); Gess 1986: 153, 157 (prey); Pulawski 2013: 18 (in catalog of world Sphecidae sensu lato).

Note. Handlirsch (1893) described the species from specimens from “Cap” and from “Kafferland”. Arnold (1929) recorded it from Johannesburg, Cape Town, Lady Grey and Grahamstown.

Material examined. LESOTHO: Bokong P.O. [29.17S, 28.23E], 26.xii.1946 (L. Bevis), 1 ♂ [AMGS]; Mamathes [29.08S, 27.51E], i.1940 (C. Jacot-Guillarmod), 2 ♀♀ (1 ♀ with prey: Calliphoridae), [SAMC ex. NMBZ; DMSA]; Mamathes, ii.1940 (C. Jacot-Guillarmod), 1 ♀ [DMSA]; Mamathes, 7.i.1934 (C. Jacot-Guillarmod), 1 ♂, i.1940 (C. Jacot-Guillarmod) 6 ♀♀ (4 with prey, Syrphidae, Calliphoridae, ?Muscidae), xii.4.1941 (C. Jacot-Guillarmod and A. Jacot-Guillarmod), 1 ♀, 19.i.1947 (C. Jacot-Guillarmod), 7 ♂♂, 1 ♀, 14.i.1951 (C. Jacot-Guillarmod), 1 ♂ [AMGS]; nr. Mokhotlong (7800 feet) [circa 29.17S, 29.04E], 15.i.1955 (L. Bevis), 4 ♀♀, 5 ♂♂ [DMSA]; Malingoaneng [29.19S, 28.47E], 15.i.1955 (A. Jacot-Guillarmod) 1 ♀, 2 ♂ [AMGS]; Roma [29.28S, 27.44E] 17.xii.1964 (C. Jacot-Guillarmod) 1 ♂, 1 ♀, 17.xii.1964 (D.J. Brothers), 2 ♂♂ [AMGS]; Tlametlu River [29.28S, 27.25E], 8.i.1953 (C. Jacot-Guillarmod), 1 ♂, 1 ♀, 26.i.1955 (C. Jacot-Guillarmod), 7 ♀♀ [AMGS]. SWAZILAND: Swaziland, 1.xi.1912 (no collector), 1 ♂ [SANC]. SOUTH AFRICA: GAUTENG: Johannesburg [26.12S, 28.2E], 24.xii.1907 (Duncan), 1 ♀ [AMGS]; Florida Hills [26.10S, 27.56E], 17.ii.1962 (Empey), 1 ♂ [AMGS]; Benoni [26.11S, 28.18E], 17.xii.1962 (Empey), 1 ♂ [AMGS]; Pretoria [25.44S, 28.12E], 1912 (collector ?), 1 ♀ [SANC]; Pretoria [25.44S, 28.12E], i.1939 (G.C. Ulyett), 3 ♀♀ [SANC]; Strubens Valley, Florida [26.31S, 29.57E], 26.ii.1961 (Empey), 2 ♀♀ [AMGS]; Strubens Valley, Florida, 17.iii.1962 (Empey), 1 ♂ [AMGS]; Mondeor [26.16S, 28.0E], 11.xii.1959 (Empey), 1 ♂ [AMGS]. MPUMALANGA: Brakfontein b. Delmas [26.08S, 28.43E], 5.iii.1924 (Lingnau), 1 ♀ [SAMC ex NMBZ]. KWAZULU-NATAL: Himeville [29.45S, 29.30E], 24.xii.1938 (Nat.Museum S. Rhodesia), 1 ♂ [SAMC ex NMBZ]; Sani Pass, nr Himeville [29.35S, 29.33E], 21.xii.1938 (L. Bevis), 2 ♂♂ [DMSA]. FREE STATE: Wepener [29.44S, 27.02E], 29.xii.1924 (Lingnau), 1 ♂ [SAMC ex NMBZ]; EASTERN CAPE: Hamburg [33.17S, 27.28E], 26.ii.1961 (collector ?), 1 ♀ [SANC]. WESTERN CAPE: Palmiet R[iver] [near Kleinmond, southern Hottentots Holland Mts.] [circa 34.20S, 19.02E], xii.1932 (H.G. Wood), 7 ♂♂ [SAMC].

Geographical distribution. Widespread in southern Zimbabwe, Botswana and Namibia and extending south through South Africa to the coast (Fig. 7d).

Flower associations. Unknown.

Nesting. Unknown

Prey. Recorded taking four, possibly five, families of Diptera: Sarcophagidae, Syrphidae, Calliphoridae, and, possibly, Muscidae.

***Bembix carinata* F. Smith**

http://species-id.net/wiki/Bembix_carinata

Fig. 5

Bembex undulata Dahlbom, 1845: 487, ♀, junior primary homonym of *Bembex undulata* Spinola, 1839 (Holotype or syntype, ♀, South Africa, no locality, in LUND).

Bembex carinata F. Smith, 1856: 323, ♀ (Holotype or syntype, ♀, South Africa, Cape of Good Hope in BMNH). Synonymised with *Bembex undulata* by Dalla Torre 1897: 503 (in catalogue of world Hymenoptera); Handlirsch 1893: 800 (in revision of world Bembicinae); Dalla Torre 1897: 503 (in catalogue of world Hymenoptera).

Bembex carinata F. Smith, Lohrmann 1939: 142 (member of *melanopa* group); R. Bohart and Menke 1976: 545 (in checklist of world Sphecidae); Pulawski 2013 (in catalogue of world Sphecidae sensu lato).

Additional records extracted from database of specimens in collection of SAMC.

SOUTH AFRICA: West Cape: Mossel Bay [34.11S, 22.08E], 1.xii.1921 (R.E. Turner), two specimens, sex not given, one determined by G. Arnold; Cape Town [33.56S, 18.25E], 1.i.1915 (L. Peringuey), sex not given, determined by H. Brauns; Cape Town, 1.i.1909 (L. Peringuey jnr), sex not given, determined by J.C. Bridwell.

Geographical distribution. Recorded only from Cape Town and Mossel Bay, possibly indicating a south western coastal distribution. Further records are required to establish a distribution pattern.

Floral associations. Unknown.

Nesting. Unknown.

Prey. Unknown.

***Bembix compedita* R. Turner**

http://species-id.net/wiki/Bembix_compedita

Bembex kohli R. Turner, 1912: 415, ♂, ♀, junior primary homonym of *Bembex kohlii* Morice, 1897 (Syntypes, Malawi, Blantyre and Mlanji Boma in BMNH).

Bembex compedita R. Turner, 1913: 746, substitute name for *Bembex kohli* R. Turner, 1912; Arnold 1929: 375, figs 38, 38a–c, ♂, ♀ (in revision of South African Sphecidae); Arnold 1930: 21 (in checklist of Afrotropical Sphecidae).

Bembix compedita R. Turner, 1912, Lohrmann 1948: 286 (member of *fuscipennis* species group); R. Bohart and Menke 1976: 546 (in checklist of world Sphecidae); Pulawski 2013: 21 (in catalogue of world Sphecidae sensu lato).

Specimens examined. MALAWI (as Nyasaland): S.W. of Lake Chilwa, 9.i.1914 (S.A. Neave) 1 ♀; Zomba, 9.xi.1943 (Nat. Museum S. Rhodesia), 1 ♂, 1 ♀ [both SAMC ex NMBZ]; Zomba, 9.xi.1943 (Nat. Museum S. Rhodesia) 2 ♀♀ [AMSG].

Additional records extracted from database of specimens in collection of SAMC. KENYA: Nairobi, 7.v.1920 (no collector given), no sex given, no determiner given; MALAWI [as Nyasaland], Zomba, 20.vii.1911, no sex given, no determiner given; same locality, 1.i.1915 (H.S. Stannus), no sex given, no determiner given; same locality, 20.vii.1911 (R. Drumond), no sex given, no determiner given; same locality, 9.xi.1943 (Rhodesia Museum), no sex given, no determiner given; same locality, 18.xi.1943 (Rhodesia Museum), no sex given, no determiner given. SOUTH AFRICA: Free State, Bloemfontein [29.06S, 26.07E], 20.iii.1921 (C.F. Jacot-Guillarmod), no sex given, determined by G. Arnold.

Geographical distribution. The above records confirm the northern occurrence of this species in Malawi and Kenya, however, the record for Bloemfontein suggests that it is also found to the south in the Free State. As there is one record only from the south additional material is required to establish the veracity of this record.

Floral associations. Unknown.

Nesting. Unknown

Prey. Unknown.

Bembix cultrifera Arnold

http://species-id.net/wiki/Bembix_cultrifera

Fig. 6e

Bembix cultrifera Arnold, 1929: 339, figs. 9, 9a-c, pl. 6, figs 4, 44, ♂, ♀ (Holotype, ♂, Southern Rhodesia [Zimbabwe], Bulawayo, in SAMC ex NMBZ) (in revision of southern African Sphecidae); R. Bohart and Menke 1976: 546 (in checklist of world Sphecidae); W.J. Pulawski 2013: 21 (in catalogue of world Sphecidae sensu lato).

Material examined. ZIMBABWE: no locality, no date (M. Jeffreys) ♀; Bulawayo [20.07S, 28.32E], 24.xii.1924 (R.H.R. Stevenson), ♀, Xmas [Christmas], 1924 (R.H.R. Stevenson), ♀, 28.xii.1924 (R.H.R. Stevenson), Allotype ♀; Sanyati Valley [17.58S, 29.17E], ix-x.1925 (R.H.R. Stevenson), ♀; Sawmills [19.35S, 28.02E], 10.xii.1926 R.H.R. Stevenson), holotype, ♂; Turk Mine [19.44S, 28.48E], 18.xi.1957 (Nat. Museum S. Rhodesia), 2 ♂♂, 1.xii.1957 (Nat. Museum. S. Rhodesia) 1 ♂; Turk Mine Matabele'd, 23.xi.1959 (Nat. Museum S.R.), 1 ♀; Umtali [18.57S, 32.40E], i.1928 (R.H.R. Stevenson), 1 ♀; 29.xi.1930 (G. Arnold), 1 ♀;



Figure 5. *Bembix carinata*, female and male. (approximate length of female: 17 mm).

same date (Rhodesia Museum), 1 ♀ [all SAMC ex NMBZ]. NAMIBIA: Tsumeb [19.15S, 17.02E], i.1953 (N. Ward-Able). SOUTH AFRICA: Gauteng: Buffelspoort Dam [25.47S, 27.29E], 1.xii.1968 (H. Empey), 1 ♀ [AMGS]; Limpopo, Hope (Ellisras) [now Lephale] [23.40S, 27.45E], 23.xi.1968 (H. Empey), 1 ♂ [AMGS].

The specimen from Buffelspoort Dam agrees well with the characters indicated by Arnold (1929: 340) in his comparison with the female of *speciosa* Arnold (= *regnata* Parker) except that the mesonotal disc has well developed streaks (forming a U-shaped [yellow] mark, the lateral arms, however, not joining the basal part). Some females from Bulawayo and Umtali also show rudiments of the lateral arms of this mark. In *regnata* Parker this yellow mark seems to be variable in its size and development, so it is clear that it has no value as a taxonomic character to separate these two species.

Three specimens (determined by G. Arnold) are given in the database of SAMC, two from Victoria Falls [17.55S, 25.50E], and one from Bulawayo [20.07S, 28.32E], sex not given.

Geographical distribution. Recorded from Zimbabwe, from north to south, from eastern Namibia and from Limpopo, northern South Africa (Fig. 7e).

Floral associations. Unknown.

Nesting. Unknown

Prey. Unknown.

***Bembix denticauda* Arnold**http://species-id.net/wiki/Bembix_denticauda

Fig. 6f

Bembix denticauda Arnold, 1946: 91, figs 39, 39a, 39b, ♂, ♀ (Syntypes, Zimbabwe, Melsetter [Chimanimani] [19.48S, 32.52E], in SAMC ex NMBZ). R. Bohart and Menke 1976: 546 (in checklist of world Sphecidae); Pulawski 2013: 22 (in catalogue of world Sphecidae sensu lato).

Material examined. SOUTH AFRICA: Transvaal [Limpopo], Letaba River Res. [23.39S, 31.9E], 9.ix.1965 (H.N. Empey), 1 ♂.

Geographical distribution. The previously published records are from southeastern Zimbabwe; the present records extend the distribution south of the Limpopo River into Limpopo Province, South Africa (Fig. 7f).

Floral associations. Unknown.

Nesting. Unknown

Prey. Unknown.

***Bembix diversipennis* F. Smith**http://species-id.net/wiki/Bembix_diversipennis

Fig. 8a

Bembex diversipennis F. Smith, 1873b: 297, ♂, ♀ (Syntypes, Angola, in BMNH); Radoszkowski 1881: 2007 (Angola); Handlirsch 1893c: 786 (in revision of world Bembicinae); Dalla Torre 1897: 504 (in catalogue of world Hymenoptera); Magretti 1899: 605 (Somalia: Lugh at 3°48'N 42°33'E); Bingham 1902 (South Africa: Pretoria); R. Turner 1912: 373 (Angola, Zimbabwe, Ethiopia); Arnold 1929: 346 (in revision of southern African Sphecidae); Schouteden 1930: 96 (Zaire); Scott in Arnold 1933: 371 (Ethiopia: Harar District).

Bembix diversipennis F. Smith, J. Parker 1929: 139 (in revision of Stizini and Bembicini, Togo); Lohrmann 1948: 446 (member of *diversipennis* species group of *Bembix*); R. Bohart and Menke 1976: 546 (in checklist of world Sphecidae); Pulawski 2013: 23 (in catalogue of world Sphecidae sensu lato).

Bembix tenebrosa J. Parker, 1929: 90, ♂, ♀ (Holotype, ♂, German East Africa [Tanzania]); Arnold 1931: 214, synonymised with *Bembex johnstoni*; J. Parker 1942: 205 (valid species); Arnold 1960: 465, synonymised with *Bembix diversipennis*.

Note. Turner (1912b: 373) wrote “the localities for this species in the National Collection [Natural History Museum, London] are from Angola to Nyasaland, Mashonaland [Zimbabwe] and Harar, Abyssinia [Ethiopia]”.

Turner (1917a: 437) wrote: “In a considerable series of that species [i.e. *diversipennis*] from E. Africa the thorax is always without yellow markings in both sexes, except

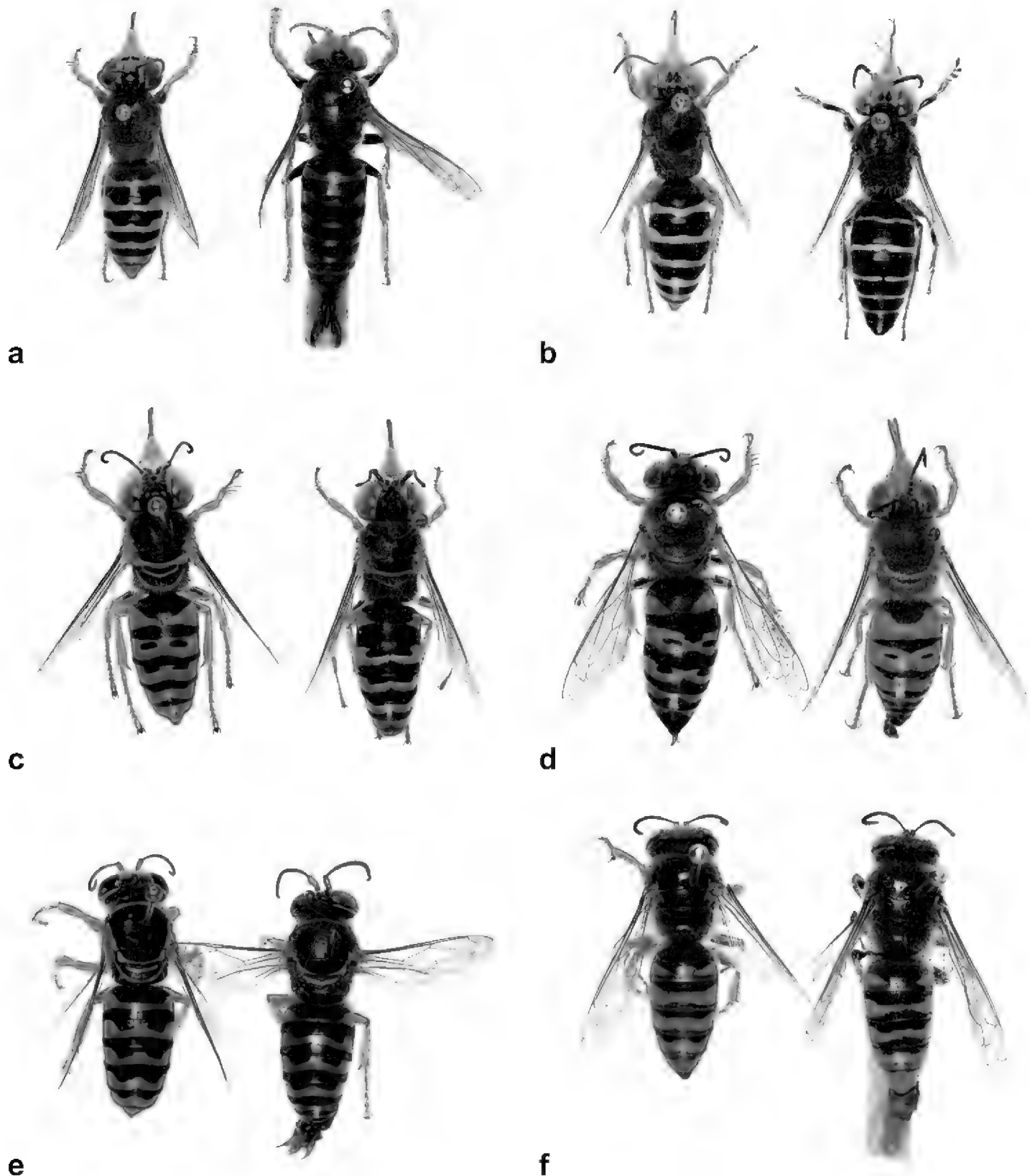


Figure 6. *Bembix* spp.: **a** *bubalus*, female, male **b** *cameronis*, female, male **c** *capensis*, female, male **d** *capicola*, female, male **e** *cultrifera*, female, male **f** *denticauda*. (approximate length of females: **a** 19.5 mm; **b** 18 mm; **c** 17 mm; **d** 18 mm; **e** 17 mm; **f** 18 mm).

one female from Harar. The yellow markings on the abdomen vary much, but do not form continuous fasciae as in most West-African specimens. The wings are hyaline in the male, more or less fuscous at the base in the female in all specimens which I have seen.”

Material examined. ZAMBIA: Buleya Mweru [18.0S, 35.0E], 25.i.1944 (Nat. Museum S. Rhodesia), 2 ♀♀ [1 ♀ SAMC; 1 ♀ SAMC ex NMBZ]; ??, 10.xii.1955 (C.B. Cottrell), 2 ♀♀, 1 ♂ [AMGS]; ZIMBABWE: Nantwich [18.36S, 26.01E], 20.xii.1949 (Nat. Museum S. Rhodesia), 1 ♂ [SAMC]; Penkridge [19.31S, 32.44E], 6.xi.1927 (R.H.R. Stevenson),

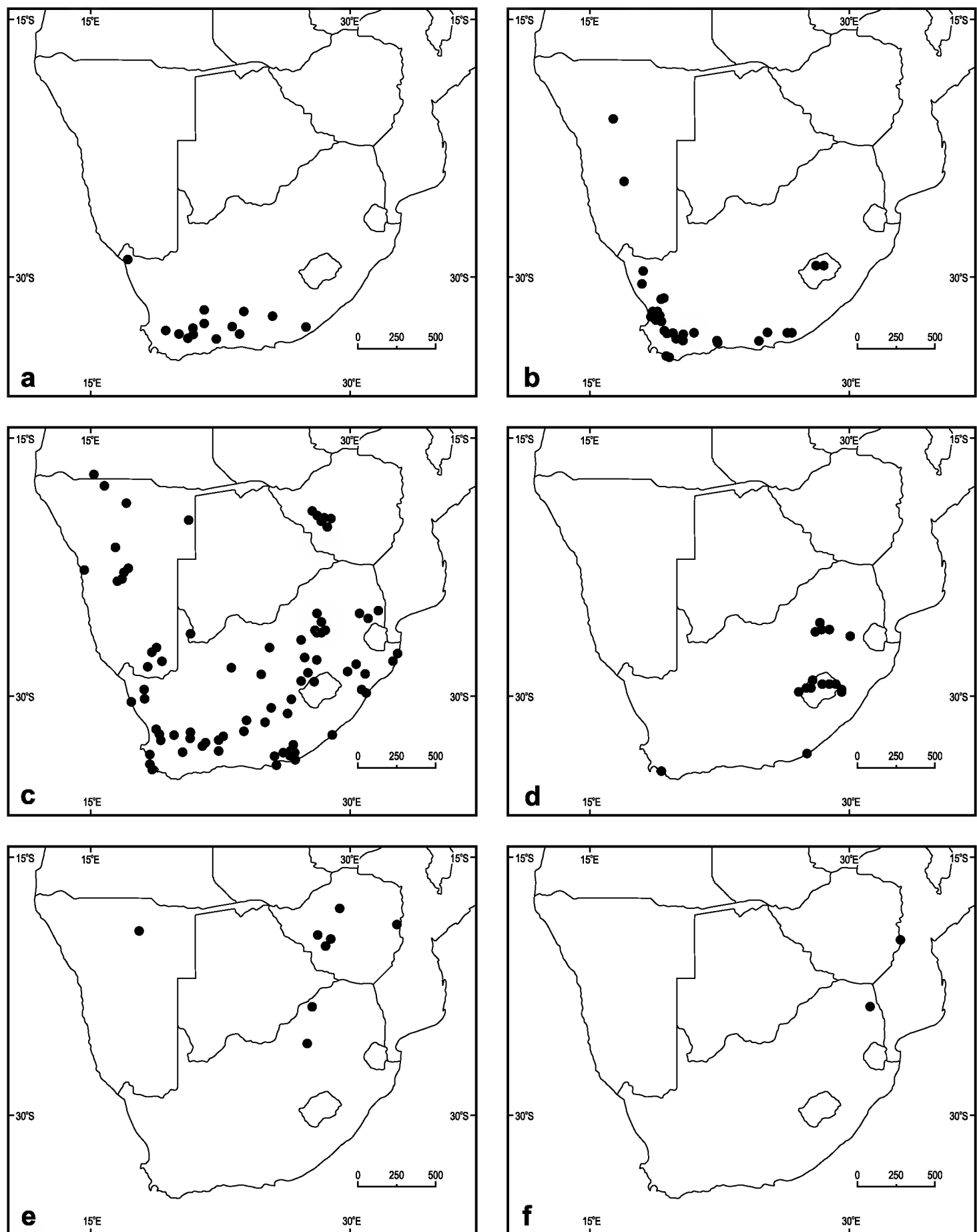


Figure 7. Distributions of collection records of *Bembix* spp.: **a** *bubalus* **b** *cameronis* **c** *capensis* **d** *capicola* **e** *cultrifera* **f** *denticauda*.

2 ♂♂ [1 ♂ SAMC; 1 ♂ SAMC ex NMBZ]; Rhodesdale [18.20S, 31.25E], 8/10.xi.1923 (R. Stevenson), 1 ♀ [AMGS]; same locality, 8/16.xi.1923 (R. Stevenson), 1 ♀ [AMGS], 1 ♂ [SAMC], 1 ♂ [SAMC ex NMBZ]; same locality, 10/16.xi.1923 (R. Stevenson), 1 ♂ [SAMC ex NMBZ]; T[relawney] R[esearch] S[tation, Harare] [17.32S, 30.28E],

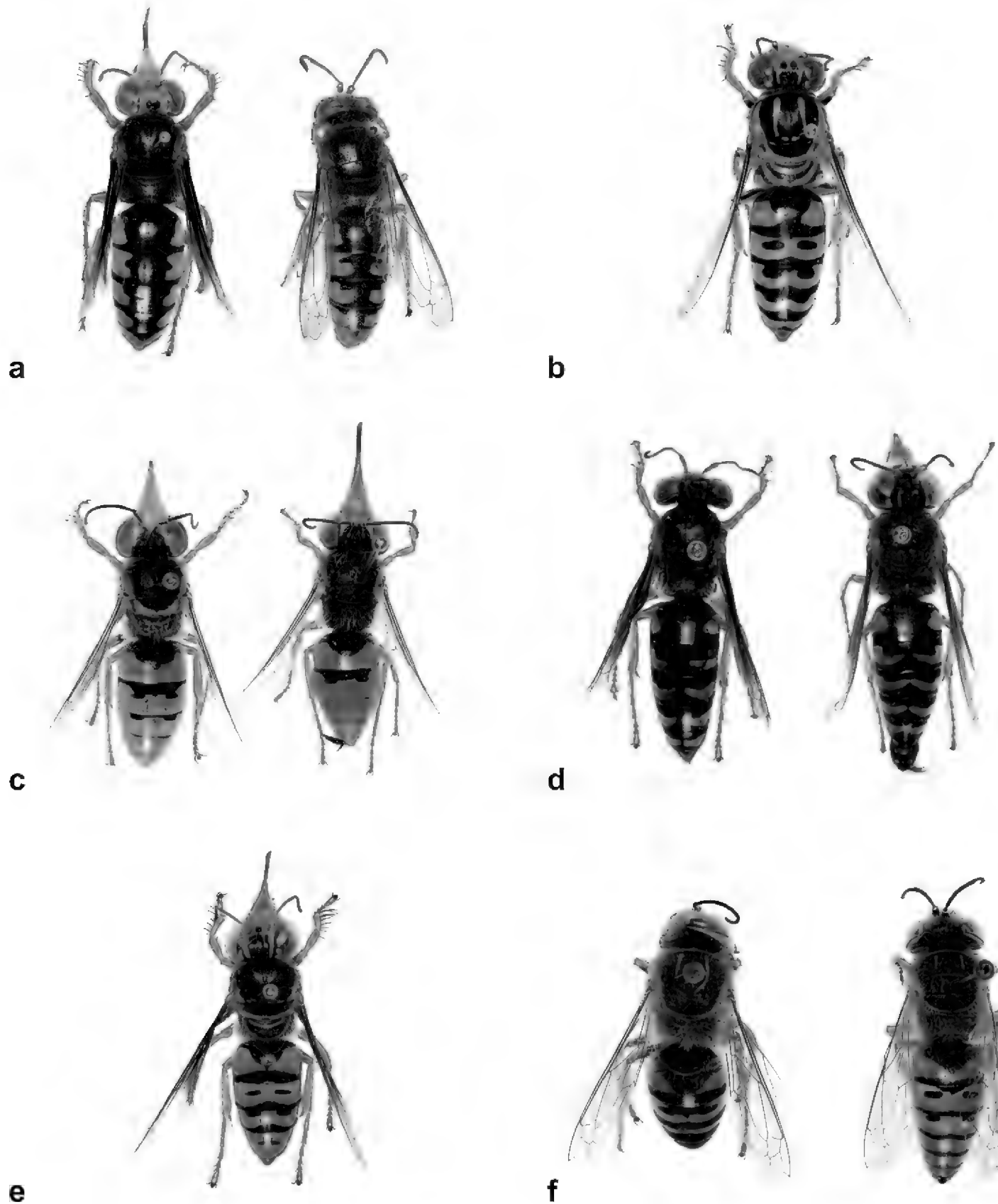


Figure 8. **a** *Bembix* spp.: *diversipennis*, female, male **b** *flavicincta*, female **c** *fraudulenta*, female, male **d** *fuscipennis*, southern melanistic form, female, male **e** *fuscipennis*, northern yellow form, female **f** *hare-narum*, female, male. (approximate lengths of females: **a** 27 mm; **b** 22.5 mm; **c** 12.5 mm; **d** 18.5 mm; **e** 18 mm; **f** 15.5 mm)

14.xii.1953 [(N.J. Myers)], 1 ♀ [AMGS]; Umtali District [circa 18.57S, 34.40E], 24.x.1931 (P.A. Sheppard), 2 ♂♂ [1 ♂ SAMC; 1 ♂ SAMC ex NMBZ]; same locality, 2.xi.1931 (P.A. Sheppard, 1 ♂ [SAMC ex NMBZ]; same locality, 19.xi.1931 (P.A. Sheppard), 1 ♂ [AMGS]; Turk Mine [19.44S, 28.45 E], 6.xii.1956 (Nat.Museum S. Rhodesia), 2 ♀♀ [SAMC ex NMBZ]; same locality, 1.xii.1957 (Nat.Museum S. Rhodesia),

2 ♂♂ [1 ♂ SAMC, 1 ♂ SAMC ex NMBZ]; same locality, 2.xi.1958 (Nat. Museum S. Rhodesia), 1 ♂ [SAMC ex NMBZ]; same locality, 1.xi.1959 (Nat. Museum S. R.), 1 ♂ [AMGS]; Matopos [now Matobo] [20.35S, 28.30E], 18.xi.1923 (G. Arnold), 2 ♀♀ [1 ♀ SAMC; 1 ♀ SAMC ex NMBZ]; same locality, 18.xi.1923 ((Rhodesia Museum), 1 ♂ [SAMC ex NMBZ]. MOZAMBIQUE: Dondo, PEA [19.41S, 34.45E], 4.ii.1924 (R.H.R. Stevenson), 2 ♀♀ [1 ♀ SAMC; 1 ♀ SAMC ex NMBZ]. SOUTH AFRICA: LIMPOPO: Ellisras [now Lephalale] [23.40S, 27.46E], 22.xi.1978 (D.J. Brothers), 1 ♀ [AMGS]; Hope, Ellisras [23.40S, 27.45E], 11.xi.1967 (F.J. Herbst), 1 ♂ [AMGS]; Hope, Ellisras [now Lephalale], 12.xi.1967 (Empey), 1 ♀, 2 ♂♂ [AMGS]; Swadini, Blyde River, E. Transvaal [24.34S, 30.48E], 1.xii.1982 (F.J. Herbst), 1 ♀, 1 ♂ [AMGS]; Sabie [25.06S, 30.47E], 22.xii.1966 (H. Empey), 1 ♂ [AMGS]; Sabie Bungalow [circa 25.10S, 30.48E], 30.xii.1962 (H.N. Empey), 1 ♂ [AMGS]; Skukusa, K[ruger] Nat[ional] Park [24.59S, 31.38E], 17.xi.1979 (F.J. Herbst), 2 ♀♀, 1 ♂ [AMGS]; Vaalwater [24.15S, 28.08E], 24.xi.1968 (F.J. Herbst), 1 ♂ [AMGS]; Rust de Winter [25.13S, 28.29], 8.ii.1975 (Empey), 1 ♀ [AMGS]; Letaba Reserve, North East Transvaal [23.39S, 31.04E], 1.x.1966 (H. Empey), 1 ♂ [AMGS]; Buffelspoort Dam, Western Transvaal [25.47S, 27.29E], 27.xii.1970 (Empey), 2 ♀♀, 2 ♂♂ [AMGS]; Buffelspoort Dam, 7.xii.1968 (F.J. Herbst), 1 ♂ [AMGS]; Buffelspoort Dam, 31.12.1978 (F.J. Herbst), 3 ♀♀, 2 ♂♂ [AMGS]; Matlabas, N.W. Tvl [24.16S, 27.27E], 18.i.1981 (F.J. Herbst), 1 ♀ [AMGS]; GAUT-ENG: Pretoria [25.44S, 28.12E], 20.i.1919 (Brauns), 2 ♀♀ [1 ♀ SAMC; 1 ♀ SAMC ex NMBZ]; Vaal Dam [27.00S, 28.14E], 5.iii.1967 (Herbst), 1 ♀ [AMGS]. FREE STATE: Bothaville [now Kgotsong], 30.xii.1964 (D.J. Brothers), 1 ♀ [AMGS]. KWAZULU-NATAL: Sordwana [now Sodwana Bay] [27.32S, 32.41E], 16.iv.1965 (H.N. Empey), 1 ♀ [AMGS]; Sordwana Bay [now Sodwana Bay], 28.iii.1980 (F.J. Herbst), 1 ♂ [AMGS]; Mkuze Game Reserve (27.37S, 32.14E), 8–12.iii.1987 (A.J. Weaving), 2 ♀♀ [AMGS]; False Bay, [Lake St Lucia] (27.58S, 32.23E), 24.ii.–4.iii.1990 (A. Weaving), 1 ♂ [AMGS]; False Bay, Lake St. Lucia, 2–21.ii.1991 (A. Weaving), 1 ♀ [AMGS]; Fanies Island, [Lake] St Lucia (28.06S, 32.26E), 4–5.iii.1987 (A.J. Weaving), 1 ♂ [AMGS].

Geographical distribution. From the records available this species appears to have a predominantly northern distribution (Fig. 9a), extending from the Free State and KwaZulu-Natal northwards to Ethiopia.

Flower associations. Unknown.

Nesting. Unknown.

Prey. Unknown.

Bembix flavicincta Turner

http://species-id.net/wiki/Bembix_flavicincta

Fig. 8b

Bembex flavicincta Turner, 1912a: 414, ♂, ♀ (Syntypes, Zambia, Pakasa, Luangwa Valley; Malawi, W shore of Lake Malawi, in BMNH); Arnold 1929: 376 (in revision of southern African Sphecidae); Arnold 1930: 21 (in checklist of Afrotropical Sphecidae).

Bembix flavicincta Turner, Lohrmann 1948: 448 (member of the *fuscipennis* group); R. Bohart and Menke 1976: 546 (in checklist of world Sphecidae as *flavocincta*); Gess 1986: 153 (as *flavocincta*, prey); Pulawski 2013: 28 (in catalogue of world Sphecidae sensu lato).

Material examined. MALAWI: Domira Bay [13.35S, 34.27E], Lake Nyasa [Malawi], no date (J.B. Casey), 16 ♀♀; Salima Bay [13.47S, 34.26E], L. Nyasa, 5.xi.1943 (Nat. Museum S. Rhodesia), 2 ♀♀ [both SAMC ex NMBZ]. ZIMBABWE: Gwanda [20.57S, 29.02E], xi.1965 (Nat. Museum S. Rhodesia), 1 ♀; Sanyati Valley [17.57S, 29.18E], ix–x.1925 (R.H.R. Stevenson), 3 ♀♀; Sawmills [19.35S, 28.02E], 22.xii.1928 (Rhod. Museum), 2 ♀ ♀ [all SAMC ex NMBZ]. SOUTH AFRICA: Zululand [KwaZulu-Natal], Mfongosi [27.18S, 32.10E], iii.1914 (W. E. Jones), 1 ♀ [DMSA]; Limpopo, Ellisras [23.40S, 27.46E], 19.xii.1963 (H.N. Empey), 1 ♀ [AMGS].

Geographical distribution. Previously published records are from Malawi and Zimbabwe; the present records extend the distribution south of the Limpopo (Fig. 9b).

Floral associations. Unknown.

Nesting. Unknown.

Prey. Diptera: Bombyliidae and Sarcophagidae (*Sarcophaga* sp.).

Bembix fraudulenta Arnold

http://species-id.net/wiki/Bembix_fraudulenta

Fig. 8c

Bembix fraudulenta Arnold, 1929: 367, figs 32, 32a, pl. 6, figs, 41, 42, ♂, ♀ (Syntypes, South Africa, Durban, South Africa, in DMSA) (in revision of southern African Sphecidae); Arnold 1930: 21 (in checklist of Afrotropical Sphecidae).

Bembix fraudulenta Arnold, R. Bohart and Menke 1976: 546 (in checklist of world Sphecidae); Gess 1986: 153 (flower visiting, prey); Gess and Gess 1988: 246–247, Fig. 14.19 (habitat); Gess and Gess 1998: 351, Fig. 22.18 (habitat); Pulawski 2013: 29 (in catalogue of world Sphecidae sensu lato).

Material examined. MOZAMBIQUE: Paradise Magoo, circa 20 km N. of Xai-Xai [24.59S, 33.58E], 2.vii.2012 (D.W. and G.M. Gess), 2 ♀♀, 1 ♂ [AMGS]; Inhaca Island [26.00S, 32.33E], 12.xii.1954 (E. McC. Callan), 1 ♀, 1 ♂ [AMGS]. SOUTH AFRICA: KWAZULU-NATAL: Umhlanga Rocks [29.43S, 31.06E], 1.i.1955 (E. McC. Callan), 1 ♂ [AMGS]; same locality, 4.i.1955 (E. McC. Callan), 1 ♀ (with prey: Mydidae: *Nomoneuroides natalensis* Hesse, ♂) [AMGS]; Durban (Bluff/2537) [29.54S, 31.02E], 27.iii.1920 (C.N. Barker), holotype ♂ (Red Type label of Arnold's) [DMSA]; same locality, accession number and collector, 19. iii.1920, ?Paratype ♀ (Red Type label of Arnold's) [DMSA]; same locality, accession number, date and collector, 1 ♀ (Paratype label attached by FWG) [SAMCC ex NMSR]; same locality, accession number and collector, 27.iii.1920, 1 ♀ (Paratype label attached by FWG) [AMGS];

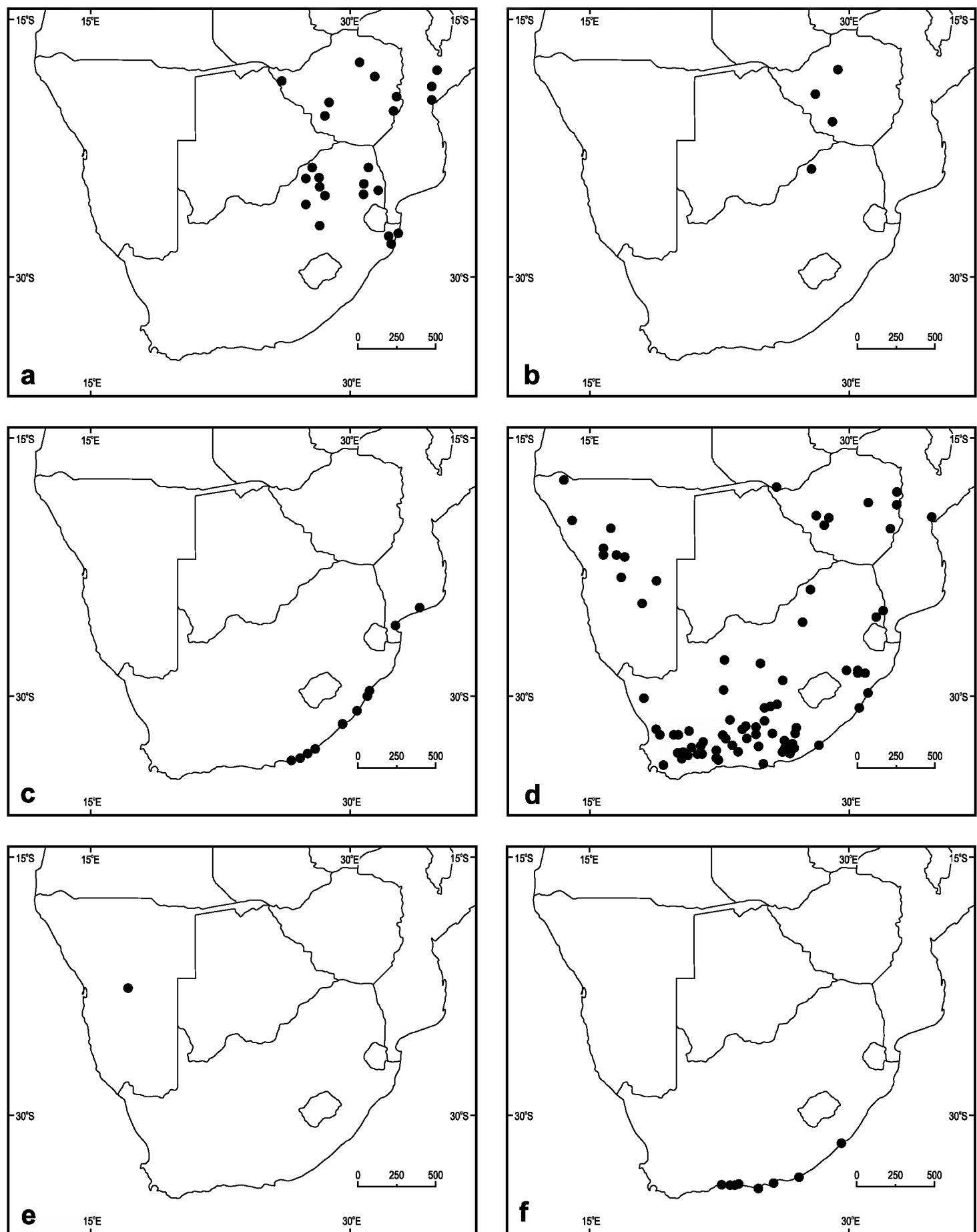


Figure 9. Distributions of collection records of *Bembix* species: **a** *diversipennis* **b** *flavicineta* **c** *fraudulenta* **d** *fuscipennis* **e** *gracilens* **f** *harenarum*.

same locality and collector [but accession number 2644 and date 26.iii.1921], 1 ♀ (Paratype label attached by FWG) [AMGS]; Durban (Beach B./2651), 30.iv.1921 (C.N. Barker), 1 ♀ [SAMC ex NMBZ]; Hillary, Durban [29.53S, 30.57E], no date (F. Herbst), 1 ♂ [AMGS]; Isipingo [Beach] [30.00S, 30.57E], 25.ii.1940 (L. Bevis), 1 ♀

[DMSA]; St. Michael's on Sea [30.50S, 30.23E], 14.i.1953 (E. McC. Callan), 2 ♀♀, 1 ♂ [AMGS]. EASTERN CAPE: Port St. Johns [31.38S, 29.33E], 12.ii.1970 (J.G.H. Londt), 1 ♀ [AMGS]; East London [33.03S, 27.55E], iv.1947 (S. Seagrief), 1 ♀ [AMGS]; same locality, 28.ii.1960 (E. McC. Callan), 1 ♂ [AMGS]; Hamburg [33.17S, 27.28E], 25–26.iii.1987 (F.W. and S.K. Gess), 2 ♀♀ [AMGS]; Rietrivier Mouth near Port Alfred [33.33S, 27.01E], 11.i.1984 (R.W. Gess), 1 ♂ (on flowers of *Ipomoea pes-caprae* (L.) R. Br. *brasiliensis* (L.) Ooststr., Convolvulaceae); same locality, 3.ii.1984 (F.W. Gess), 3 ♂♂ (2 ♂♂ visiting flowers of *Ipomoea pes-caprae* (L.) R. Br. *brasiliensis*); same locality and date (S.K. Gess), 1 ♂ (visiting flowers of *Ipomoea pes-caprae* (L.) R. Br. *brasiliensis*); Kenton-on-Sea [33.41S, 26.40E], 20.i.1984 (D.W. Gess), 1 ♀ (on flowers of white mesembs); Boknes (33.43S, 26.35E), 16.i.1984 (D.W. Gess), 1 ♂ (on flowers of *Phylohydrax carnosus* (Hochst.) Puff, Rubiaceae); same locality, 20.i.1984 (F.W. Gess), 2 ♂♂ (on flowers of *Phylohydrax carnosus*); same locality and date (R.W. Gess), 1 ♀, 7 ♂♂ (1 ♀, 6 ♂♂ on flowers of *Phylohydrax carnosus*); same locality, 24.i.1984 (D.W. Gess), 1 ♀, 2 ♂♂ (1 ♂ on *Gazania* flowers); same locality and date (F.W. Gess), 2 ♀♀, 2 ♂♂ (on flowers of *Phylohydrax carnosus*); same locality and date (R.W. Gess), 2 ♀♀, 1 ♂ (on flowers of *Phylohydrax carnosus*); same locality, 27.i.1984 (F.W. Gess), 1 ♂ (on flowers of *Phylohydrax carnosus*); same locality, 12.iv.1984 (D.W. Gess), 1 ♀; same locality, 9.i.1986 (D.W. Gess), 4 ♂♂ (on flowers of *Phylohydrax carnosus*) [all AMGS].

Geographical distribution. The species appears to have a strictly coastal distribution (Fig. 9c). At present it is known from coastal Mozambique, Kwazulu-Natal and the Eastern Cape (to at least as far south as Boknes, 33.43S, 26.35E) coasts. At Rietrivier Mouth, Kenton-on-Sea and Boknes the species was found frequenting the first line of supra-littoral dunes and visiting the flowers of plants associated with these dunes.

Floral associations. Recorded from four plant families: Convolvulaceae (*Ipomoea pes-caprae* (L.) R. Br. *brasiliensis* (L.) Ooststr.); Rubiaceae (*Phylohydrax carnosus* (Hochst.) Puff); Asteraceae (*Gazania* sp.); and Aizoaceae (*Mesembryanthema*).

Nesting. Unknown but most likely nesting in the supra-littoral dunes.

Prey. Recorded taking one family of Diptera: Mydidae (one female captured with mydid prey, *Nomoneuroides natalensis* Hesse, 1969 (♂ Paratype)).

***Bembix fuscipennis* Lepeletier**

http://species-id.net/wiki/Bembix_fuscipennis

Fig. 8d, e

Bembex fuscipennis Lepeletier, 1845: 271, ♂, ♀ (Syntypes, “Cape of Good Hope”, depository ?); F. Smith 1856 (in catalogue of Hymenoptera in British Museum); Taschenberg 1870: 19 (South Africa: Cape area); Handlirsch 1893: 850, pl. 3, figs 2, 25, pl. 7, fig. 29, ♂, ♀ (in revision of world Bembicini); Dalla Torre 1897: 505 (in catalogue of world Hymenoptera); Arnold 1929: 373, figs 36, 36a, 36b, pl. 6, fig. 30, ♂, ♀ (in revision of southern African Sphecidae); Arnold 1930: 21 (in checklist of Afrotropical Sphecidae); Schouteden 1930: 96 (Zaire); Cuthbertson,

1939 (prey and nest parasite, *Craticulina tabaniformis* (Fabricius), Sarcophagidae); Berland 1950: 296 (Niger, Air area); Pagliano 2011: 121 (specimens in collection of Spinola, Torino).

Bembix fuscipennis Lepeletier, J. Parker 1929: 91 (in revision of Stizini and Bembicini); Giordani Soika 1939: 105 (Eritrea: Keren); Guiglia 1943: 75 (Ethiopia: Gamo Gofa: Sagan – Omo Region); J. Parker 1942: 206, pl. 18, figs 15, 18 (valid species); Lohrmann 1948: 448 (member of *fuscipennis* species group of *Bembix*); Guiglia 1950: 240 (Ethiopia: Gamo Gofa: Caschei); Arnold 1951: 138, figs 30, 30a (discussion of male genitalia); Leclercq 1955: 408 (Ruanda); de Beaumont 1967: 506 (South Africa, Natal); Gess 1981: 21 (South Africa: 18 km WNW Grahamstown, nesting in friable soil); R. Bohart and Menke 1976: 546 (in checklist of world Sphecidae); Casolari and Casolari Moreno 1980: 115 (specimens in M. Spinola collection); Gess 1981: 21 (nesting in friable soil); Gess 1986: 158 (prey); Guichard 1989: 145 (Saudi Arabia, Yemen); Gess and Gess 2003: 123 (flower visiting records); Gadallah and Assery 2004: 230 (in catalogue of Sphecidae of Saudi Arabia); Pulawski 2013: 30–31 (in catalogue of world Sphecidae sensu lato).

Bembex stevensoni J. Parker, 1929: 92, ♂, ♀ (Holotype, ♂, Zimbabwe, Bulawayo in USNM); Arnold 1931: 214, synonymised with *Bembex fuscipennis*; J. Parker 1942: 2006 (valid species); Arnold 1951: 138 (discussion of male genitalia).

Note. In this species there is a marked north-south variation in colouration. Specimens examined (as listed below under *Material examined*) from the north, Tanzania, Zambia, Zimbabwe and northern South Africa, are characterised by the entire clypeus brownish amber, whereas in specimens examined from the south only the anterior third to half of the clypeus is brownish amber, the rest of the clypeus is black. A certain degree of overlap of the two colour forms is noted in specimens examined from the Free State and KwaZulu-Natal.

This observation is supported by the published descriptions: Parker (1929) in recording a female from Tabora (Tanzania) and a male from Bulawayo (Zimbabwe) stated that “The clypeus of the female before me is entirely ferruginous”; Arnold (1929) recording specimens from Zimbabwe and northern South Africa stated, “labrum and clypeus brownish amber yellow”; Handlirsch (1893) referring to specimens examined by him from “Transvaal”, “Port Natal” and “Cape of Good Hope”, that is from both the north and the south, noted, “Corpus nigrum, orbitus, mague apicali clipei (raro toto clipeo) et labro ferrugineo-luteis,”. Lepeletier (1845) in his description of both sexes from the “Cap de Bonne-Espérance” stated inter alia, “Clypeus niger, margine antico ferrugineo, ...”.

Indeed, specimens from the north are altogether less melanistic than those from the south. The pale colouring of the streak on each side of the face, the spots behind the antennal sockets, the band of spots below the ocellar region, the flagellum, the yellow spot on the posterior angles of the epinotal dorsum and the pale bands on the tergites are all greatly reduced in specimens from the south as compared with specimens from the north.

Material examined. MALAWI: Domira B[ay] [13.35S, 34.27E], Lake Nyasa [now Lake Malawi], (alt.1760 [feet]), no date given (C.B. Casey), 1 ♀ [DMSA]. ZAMBIA: Abercorn [now Mbala] [8.50S, 31.24E], 19.vii.1945 (Nat. Museum S. Rhodesia), 1 ♀ [SAMC ex NMBZ]. ZIMBABWE: Salisbury [now Harare] [17.48S, 31.03E], 27.x.1914 (J. O'Neil), 1 ♀; Sabi Valley [20.20S, 32.20E], iii.1939 (Nat. Museum S. Rhodesia), 1 ♀ [SAMC]; Victoria Falls [17.55S, 25.50E], 1.i.1920 (G. Arnold), 1 ♀; same locality, 2.i.1920 (G. Arnold), 1 ♂ [SAMC ex NMBZ]; same locality, 16.xi.1942 (Nat. Museum S. Rhodesia) 1 ♂ [SAMC ex NMBZ]; Inyanga (4000') [18.16S, 32.43E], xii.1920 (Rhodesia Museum), 1 ♂ [SAMC ex NMBZ]; Bulawayo [20.07S, 28.32E], 30.ix.1923 (Rhodesia Museum), 1 ♀ [SAMC ex NMBZ]; same locality, 28.v.1923 (R. Stevenson), 1 ♂; same locality, 18.ii.1924 (R.H.R. Stevenson), 1 ♂ [SANC]; same locality, 10.xii.1924 (R.H.R. Stevenson), 1 ♀ [SAMC ex NMBZ]; same locality, 19.xii.1924 (R.H.R. Stevenson), 1 ♀ [SANC]; 7 m[iles] S of Chitrapodzi [?], Limpopo R[iver], 1.v.1968 (Nat.Mus. R. S. Exp), 1 ♂ [AMGS]; Sawmills [19.35S, 28.02E], 25.x.1919 (G. Arnold), 1 ♀ [SAMC ex NMBZ]; Same locality, 23.x.1922 (Rhodesia Museum), 1 ♂ [DMSA]; same locality, 22–27.xii.1923 (R.H.R. Stevenson), 1 ♀ [SAMC ex NMBZ]; same locality, 25.xii.1925 (Rhod. Museum), 1 ♀ [AMGS]; 1 ♀ [AMGS]; Umtali [18.57S, 32.40E], 17.iv.1923 (Nat. Museum S. Rhodesia), 2 ♂♂ [SAMC ex NMBZ]; Turk Mine [19.44S, 28.48E], 10.xi.1957 (Nat.Museum S. Rhodesia), 1 ♀ [SAMC ex NMBZ]. MOZAMBIQUE: Dondo [19.41S, 34.45E], 3.ii.1924 (R.H.R. Stevenson), 1 ♀ [DMSA]. NAMIBIA: circa 13 km E of Okongwati, Opuwa road (17.31S, 13.22E), 24.iii.2004 (F.W. and S.K. Gess), 1 ♀ (at water) [AMGS]; 7 km N of Palmwag (19.51S, 13.54E), 26.iii.2004 (F.W. and S.K. Gess), 1 ♀ (at water) [AMGS]; near Two Palms, Uniab River (19.53S, 13.54E), 27.iii.2004 (F.W. and S.K. Gess), 1 ♀ (at water) [AMGS]; 20 km E of Outjo (20.17S, 16.09E), 6.iv.1998 (F.W. and S.K. Gess), 1 ♀ (visiting yellow flowers of *Geigeria pectidea* (DC) Harv., Asteraceae) [AMGS]; 32 km W of Omaruru on road 2315 (21.29S, 15.43E), 2.iv.1998 (F.W. and S.K. Gess), 1 ♀ [AMGS]; between Omaruru and Wilhelmstal (21.31S, 16.03E), 3.iv.1998 (F.W. and S.K. Gess), 12 ♀♀, 1 ♂ (11 ♀♀, 1 ♂ visiting deep pink flowers of *Hermbsaedia odorata* (Burch.) T. Cooke, Amaranthaceae) [AMGS]; Otjitundu River 42 km by road west of Okahandja (21.54S, 16.31E), 2.iv.2004 (F.W. and S.K. Gess), 1 ♀ (visiting yellow flowers of *Nidorella resedifolia* DC., Asteraceae) [AMGS]; 15 km W of Karibib on road to Usakos (21.56S, 15.42E), 5.iv.1998 (F.W. and S.K. Gess), 2 ♀♀ (1 ♀ visiting yellow flowers of *Osteospermum* sp., Asteraceae) [AMGS]; Okahandja [21.59S, 16.55E], 27.xii.1977 (Empey), 1 ♀ [AMGS]; 18 km W of 1237/C26 junction (23.09S, 16.42E), 11.iii.1999 (F.W. and S.K. Gess), 1 ♀ (visiting deep pink flowers of *Hermbsaedia* sp., Amaranthaceae) [AMGS]; Mariental [24.38S, 17.58E], 28.iii.1977 (Empey), 3 ♀♀ [AMGS]; G[rea]t Karas Mountains, xi.1936 (Mus. Staff), 1 ♂ [SAMC]. SOUTH AFRICA: LIMPOPO: Afguns, Ellisras [now Lephalale] [23.50S, 27.41E], 3.iv.1972 (Empey), 1 ♂ [AMGS]. MPUMALANGA: Kruger National Park, Onder Sabie [25.7S, 31.55E], 22.v.1969 (M.W. Strydom), 1 ♀ [SANC]; same locality, 2.vi.1969 (M.W. Strydom), 1 ♂ [SANC]; Kruger National Park, Malelane [25.28S, 31.31E], 30.v.1969 (M.W. Strydom), 1 ♀ [SANC]. NORTH

WEST PROVINCE: Crystal Waters, Breedtsnek [circa 25.45S, 27.15E], 8.xi.1962 (H.N. Empey), 1 ♂ [AMGS]. FREE STATE: Bloemfontein [29.06S, 26.07E], 20.ii.1931 (C. Jacot-Guillarmod), 1 ♀. KWAZULU-NATAL: Umbilo [29.54S, 30.59E], 17/x.1915 (L. Bevis) 1 ♂ [DMSA]; Durban [29.49S, 31.01E], 7.iv.1913 (W. Haygarth), 2 ♀♀ [DMSA]; same locality, ii.1914 (W. Haygarth), 1 ♀ [SAMC]; same locality, 10.iii.1914 (W. Haygarth), 1 ♂ [DMSA]; same locality, 1.iii.1959 (C. Booth), 1 ♀ [SAMC]; Berea, Durban [29.51S, 30.60E], 27.xi.1958 (Empey), 1 ♂ [AMGS]; Tugela Ferry [28.44S, 30.27E], 13.xi.1971 (Empey), 1 ♀ [AMGS]; Ladysmith [28.32S, 29.46E], 21.iii.1963 (H.N. Empey), 1 ♀ [AMGS]; Umtentweni [30.42S, 30.28E], 5.xi.1972 (Empey), 1 ♀ [AMGS]; Mfongosi [28.43S, 30.48E], iii.1914 (W.E. Jones), 1 ♂ [SAMC]; same locality, iv.1916 (W.E. Jones), 1 ♀ [SAMC]; same locality, 1923 ([The] Misses Jones), 1 ♀, 1 ♂; Stella B[ush], i.1915 (Marley), 1 ♀ [SAMC]. NORTHERN CAPE: Olifantshoek [27.57S, 22.42E], 10.xii.1978 (Empey), 1 ♂ [AMGS]; Prieska [29.40S, 22.42E], 1.i.1978 (Empey), 1 ♀ [AMGS]; Namaqualand, Kamiesberg to Sors Sors (30.10S, 18.01E), 1 ♂ (visiting blue flowers of *Anchusa capensis* Thunb., Boraginaceae) [AMGS]; Colesburg/Norvalspont, Vanwyksfontein farm (30.39S, 25.23E), 23.ii.2000 (F.W. and S.K. Gess), 1 ♀ (visiting yellow flowers of *Tribulus terrestris* L., Zygophyllaceae) [AMGS]; Vanwyksfontein [farm], 5 m[iles] W of Norvalspont [30.39S, 25.23E], 7.v.1980 (F.W. and S.K. Gess), 4 ♀♀ [AMGS]; Vanwyksfontein [farm], 8 km W of Norvalspont [30.39S, 25.23E], 14–19.iv.1982 (F.W. Gess), 1 ♀ [AMGS]; Vanwyksfontein [farm], 8 km W of Norvalspont, 15.i.1985 (D.W. Gess), 1 ♂ (on flowering *Acacia karroo* Hayne, Fabaceae, Mimosoideae); same locality and collector, 17.i.1985, 1 ♂ (on flowering *Acacia karroo*); same locality and collector, 24.i.1985, 2 ♀♀ [AMGS]; Vanwyksfontein [farm], 8 km W of Norvalspont, 28–30.xi.1988 (R.W. Gess), 3 ♂♂; same locality and dates (F.W. and S.K. Gess), 1 ♀, 3 ♂♂ [AMGS]; Thee Kloof, Fraserburg Div[ision] [32.05S, 20.41E], xi.1935 (Mus. Staff), 9 ♂♂ [SAMC]; Tanqua Karoo, Renoster Riv. [circa 32.16S, 20.05E], xi.1952 (Mus. Expd.), 1 ♂ [SAMC]; Tankwa Karoo [circa 32.15S, 19.45E], i.1949 (Zinn-Hesse Mus. Exp.), 1 ♀ [SAMC]; Warrenton [28.09S, 24.47E], x.1939 (Mus. Staff), 1 ♂ [SAMC]; Van Schalkwyks Kraal, Venterstad Div[ision], x.1935 (Mus. Staff), 1 ♂ [SAMC]; Colesberg [30.45S, 25.05E], 12.iii.1969 (M.W. Strydom), 1 ♀ [SANC]; same locality and date (L.C. Starke), 1 ♀ [SANC]; Victoria West [31.25S, 23.04E], 10.i.1965 (H.N. Empey), 3 ♀♀, 1 ♂ [AMGS]; EASTERN CAPE: Middelburg [31.30S, 25.00E], 2.xi.1972 (E. Holm), 1 ♀ [AMGS]; Middelburg Div[ision] [circa 31.30S, 25.00E], xi.1935 (Mus. Staff), 4 ♂♂ [SAMC]; Resolution, Grahamstown [33.08S, 26.37E], 1930 (Miss Walton), 1 ♀ [SAMC]; Nieu Bethesda [31.51S, 24.34E], 30.i.2002 (F.J. Herbst), 1 ♂ [AMGS]; Mountain Zebra Park (32.15S, 25.27E), 12–16.ii.1988 (A.J. Weaving), 2 ♀♀, 1 ♂ [AMGS]; same locality, 23–29.iii.1988 (A.J. Weaving), 1 ♂ [AMGS]; Graaff- Reinet [32.13S, 24.32E], 3.i.1978 (Empey), 2 ♂♂ [AMGS]; Ecce Pass, Grahamstown [33.13S, 26.37E], 25.i.1974 (R. Bayliss), 1 ♀ [AMGS]; Whittlesea [32.10S, 26.50E], 21.ii.1971 (Empey), 1 ♀ [AMGS]; Kudu Reserve, Double Drift [33.06S, 26.47E], 15.iii.1984 (A.J. Weaving), 2 ♂♂ [AMGS]; Aberdeen [32.28S, 24.02E], xi.1935 (Mus. Staff), 1 ♀, 3 ♂♂ [SAMC]; Gardiner's Drift, Adelaide [circa

32.42S, 26.18E], iii.1954 (S. A. Museum), 8 ♀♀, 4 ♂♂ [SAMC]; Fort Beaufort, Umdala [Mdala] [32.48S, 26.41E], iii.1954 (S. A. Museum), 1 ♂ [SAMC]; Hendrik Verwoerd [now Gariep] Dam [30.30S, 25.45E], 12.iii.1969 9.l. (L.C. Starke), 1 ♀; same locality and date (M.W. Strydom), 1 ♀ [SANC]; Jeffreys Bay [34.2S, 24.55E], 17.iii.1970 (L.C. Starke), 1 ♀ [SANC]; Graaff-Reinet [32.13S, 24.32E], 14.iii.1969 (L.C. Starke), 2 ♂♂ [SANC]; Jansenville [32.57S, 24.40E], 13.iii.1970 (L.C. Starke), 1 ♂ [SANC]; Carlisle Bridge [33.05S, 26.14E], 14.i.1965 (H.N. Empey), 1 ♂ [AMGS]; Queenstown [31.52S, 26.52E], 1951 (S. Straw), 2 ♀♀; same locality, 13.xi.1999 (F.J. Herbst), 1 ♂ [AMGS]; Bedford [32.40S, 26.10E], iii.1960 (Langridge), 1 ♀ [AMGS]; [west of] Riebeek East, Swartwaterspoort [33.11S, 25.59E], i.1988 (R.W. Gess), 1 ♀ (with prey: Bombyliidae) [AMGS]; Grahamstown [33.19S, 26.31E], 21.ix.1952 (N. Gane), 1 ♀; Middelburg [31.30S, 25.00E], 3.ii.1957 (E.McC. Callan), 2 ♀♀, 1 ♂; Willowmore [33.15S, 23.30E], i.1914 (Rhodesia Museum), 1 ♀ [SAMC ex NMBZ]; Willowmore, 12.i.1965 (H.N. Empey), 2 ♂♂ [AMGS]; Alicedale [33.15S, 26.04E], 2.xii.1970 (F.W. Gess), 1 ♀, 3 ♂♂; same locality, 2.xii.1970 (J.G.H. Londt), 2 ♂♂ [AMGS]. WESTERN CAPE: Caledon Dist[ri]ct, Nuweberg Forest Stat[ion] [34.04S, 19.08E], 5.i.1990 (P. Goldblatt), 2 ♀♀ (on open flowers of *Micranthus plantagineus* [*Micranthus alopecuroides* (L.) Rothm.] Iridaceae) [AMGS]; Prince Albert Dist[ri]ct, Tierberg (Study Site) (33.10S, 22.16E), 26.xi.-5.xii.1987 (F.W., S.K. and R.W. Gess), 3 ♂♂ (on cream flowers of *Gomphocarpus filiformis* (E. Mey.) D. Dietr., Asclepiadaceae) [AMGS]; Prince Albert Dist[ri]ct, Tierberg (Res. Stat.) (33.08S, 22.16E), 26.xi.- 5.xii.1987 (F.W., S.K. and R.W. Gess), 2 ♀♀, 1 ♂ [AMGS]; Oudtshoorn, Onverwacht (33.38S, 22.14E), (R.W. Gess), 1 ♀, 1 ♂ (on flowers of *Acacia caffra* (Thunb) Willd., Fabaceae) [AMGS]; Oudtshoorn, Zebra [33.46S, 22.19E], x.1951 (Mus. Exped.), 1 ♀ [SAMC]; Touwsrivier [33.20S, 20.02E], 9.i.1975 (Empey), 1 ♀, 1 ♂ [AMGS]; Ouberg Pass, by road 27 km NE of Montagu (33.40S, 20.16E), 3.xii.1986 (S.K. Gess), 1 ♀, 1 ♂ [AMGS]; Rietbron [32.54S, 23.08E], 11.i.1965 (H.N. Empey), 2 ♀♀, 1 ♂ [AMGS]; Rietbron [32.54S, 23.08E], 19.ii.1971 (Empey), 2 ♀♀, 3 ♂♂ [AMGS]; 16.5 km from Clanwilliam on old road to Citrusdal [32.16S, 18.57E], 13.x.1990 (F.W. and S.K. Gess), 1 ♂ [AMGS]; Bergsoom Farm, Citrusdal, 17 & 18.i.2009 (D.W. and G.M. Gess), 1 ♀, 3 ♂♂ (on *Acacia karroo* Hayne, Fabaceae) [AMGS]; Clanwilliam District, Klein Alexandershoek (32.20S, 18.46E), 6.x.1988 (D.W. Gess), 1 ♂ [AMGS]; Bulshoek, Cl[an]w[illiam] [32.00S, 18.47E], xii.1956 (S. A. M.), 2 ♂♂ [SAMC]; Merweville Distr[ict] [32.40S, 21.31], i.-ii.1947 (H. Zinn), 13 ♀♀ [SAMC]; Merweville, Laingsburg Distr[ict] [32.40S, 21.31E], i.1959 (H. Zinn), 1 ♀♀, 3 ♂♂ [SAMC]; Dikbome, Merweville, Koup [32.54S, 21.22E], i.1953 (H. Zinn), 4 ♀♀, 13 ♂♂ [SAMC]; Beaufort West Dist[ri]ct [circa 32.18S, 22.36E], ii.1958 (S. A. M. sic [South African Museum]), 6 ♀♀, 8 ♂♂ [SAMC]; Beaufort West, Oukloof [circa 32.18S, 22.36E], i.1949 (Zinn-Hesse Mus,Exp.), 2 ♀♀ [SAMC]; Nieuvelde Escarpment, Rietvlei [32.20S, 21.30E], i.1949 (Zinn-Hesse Mus. Exp.), 2 ♀♀ [SAMC]; Murraysburg Disr[ict] [circa 31.58S, 23.47E], iii.1931 (Museum Staff), 18 ♀♀, 20 ♂♂ [SAMC], same locality, xi.1935 (Museum Staff), 20 ♀♀, 25 ♂♂ [SAMC]; Constable [33.16S, 20.17E], ii.1958 [Hesse et al.], 2 ♀♀, 1 ♂ [SAMC]; Koup, Laingsburg Dist[ri]ct [circa 33.24S, 21.07E],

ix.1937 (Museum Staff), 1 ♀ [SAMC]; Seven Weeks Poort [33.22S, 21.25E], ii.1935 (K.H. Barnard), 1 ♀ [SAMC]; Spitzkop. Meirings Poort [32.3S, 22.49E]. i.1935 (Museum Staff), 2 ♀♀ [SAMC]; Richmond Dist[riect] [circa 31.23S, 23.56E], iii.1931 (Museum Staff), 1 ♀♀, 5 ♂♂ [SAMC]; Spitzkop, Laingsburg Dist. [33.3S, 20.35E], iii.1938 (Mus. Staff), 1 ♂ [SAMC]; Moordenaars Karroo, Laingsberg Div. [circa 32.58S, 20.49E], iii.1937 (Mus. Staff), 2 ♀♀, 1 ♂ [SAMC].

Geographical distribution. Widespread in southern Africa (Fig. 9d), extending northwards to Ethiopia in the northeast and Zaire in the northwest.

Floral associations. Recorded from seven plant families: Asteraceae (*Geigeria pectidea* (DC) Harv., *Osteospermum* sp., *Nidorella resedifolia* DC.); Amaranthaceae (*Hermestaedia odorata* (Burch.) T. Cooke); Boraginaceae (*Anchusa capensis* Thunb.); Zygophyllaceae (*Tribulus terrestris* L.); Fabaceae (Mimosoideae, *Acacia Karroo* Hayne, *A. caffra* (Thunb) Willd.); Apocynaceae (formerly Asclepiadaceae, *Gomphocarpus filiformis* (E. Mey.) D. Dietr); Iridaceae (*Micranthus alopecuroides* (L.) Rothm.).

Nesting. Unknown.

Prey. Recorded taking seven families of Diptera: Tabanidae, Bombyliidae, Syrphidae, Muscidae, Calliphoridae, Sarcophagidae, and Tachinidae.

***Bembix gracilens* J. Parker**

http://species-id.net/wiki/Bembix_gracilens

Bembix gracilens J. Parker, 1929: 143, pl. 9, fig. 109, ♀ (Holotype, ♀, South West Africa [Namibia], no locality, in ZMHB); Arnold 1931: 217 (original description copied); Lohrmann 1948: 448 (member of *fuscipennis* species group); R. Bohart and Menke 1976: 546 (in checklist of world Sphecidae); Pulawski 2013: 33 (in catalogue of Sphecidae sensu lato).

Material examined. NAMIBIA: Windhoek [22.35S, 17.04E], 29.xii.1966 (H. Empey) ♀ [AMGS].

Geographical distribution. Recorded from Namibia (Fig. 9e).

Floral associations. Unknown.

Nesting. Unknown.

Prey. Unknown.

***Bembix harenarum* Arnold**

http://species-id.net/wiki/Bembix_harenarum

Fig. 8f

Bembex harenarum Arnold, 1929: 371, figs 35, 35a, pl. 6, figs 28, 29, ♂, ♀ (Syntypes, South Africa, Plettenberg Bay, in TMSA) (in revision of southern African Sphecidae); Arnold 1930: 21 (in checklist of Afrotropical Sphecidae).

Bembix harenarum Arnold, Lohrmann 1948: 448 (member of *fuscipennis* species group of *Bembix*); Bohart and Menke 1976: 546 (in checklist of world Sphecidae); Gess and Gess 1998: 351, Fig. 22.18 (habitat); Pulawski 2013: 34 (in catalogue of world Sphecidae sensu lato).

Material examined. SOUTH AFRICA: EASTERN CAPE: Port St. Johns [31.38S, 29.33E], xii.1961 (F. W. and S. K. Gess), 6 ♀♀, 8 ♂♂ [SAMC]; same locality and collectors, iii.1967, 11 ♀♀, 4 ♂♂ [SAMC]; Rietrivier Mouth near Port Alfred [33.33S, 27.01E], 28.i.1973 (F.W. Gess), 1 ♀; same locality, 19.ii.1978 (D.W. Gess), 1 ♀; Zwartkops [now Swartkops] [33.52S, 25.36E], Algoa Bay, ii.1919 (C. B. Krüger), 1 ♀ (seashore dunes); Klipbaai [circa 34.11S, 24.43E], between Oyster and Cape St Francis bays, 9–12.i.1988 (R.W. Gess and W. Archer), 6 ♀♀ (1 ♀ with prey: Tabanidae). WESTERN CAPE: Grootrivier [Nature's Valley], Knysna Dist.[33.59S, 23.34E], i.1955 (P.M.D. Martin), 1 ♂; same locality, 1.1958 (P.M.D. Martin), 1 ♀; Nature's Valley, 8.iii.1970 (L.C. Starke), 1 ♀ [SANCC]; Nature's Valley, Tsitsikama Forest, 28.xii.1966 (C. Jacot-Guillarmod), 7 ♂♂, 2 ♀♀ (1 ♂ bearing pollinia of Asclepiadaceae on all its claws); Wilderness [33.59S, 22.35E], George, 25.i.1922 (Brauns), 1 ♂; Plettenberg Bay [34.03S, 23.22E], i.1920 (Brauns), 1 ♀ ("See Strand") [SAMC]; Brenton-on-Sea [34.04S, 23.01E], Knysna, iv.1977 (F.W. Gess), 1 ♀ (littoral zone) – [all AMGS unless otherwise indicated].

Additional records extracted from database of specimens in collection of SAMC are from Plettenberg Bay and Bredasdorp, no sexes or determiners given.

Geographical distribution. The species appears to have a strictly coastal distribution (Fig. 9f). Known from Port St Johns to Brenton-on-Sea near Knysna and, if the unconfirmed record from SAMC is included, Bredasdorp.

Floral associations. Recorded from one plant family Apocynaceae (formerly Asclepiadaceae, based on pollinia carried on claws).

Nesting. Unknown, probably in the supra-littoral dunes.

Prey. Recorded taking one family of Diptera: Tabanidae (one female captured with tabanid prey).

Bembix karrooensis Gess

http://species-id.net/wiki/Bembix_karrooensis

Fig. 11a

Bembix karrooensis Gess, 1986: 144, figs 20–24, ♂, ♀ (Holotype, ♂, South Africa, Laingsburg District, Merweville, in SAMC); Gess and Gess 2003: 124 (flower visiting records); Pulawski 2013: 38 (in catalogue of world Sphecidae sensu lato).

Material examined. NAMIBIA: Two Palms, Uniab River (19.53S, 13.54E), 27.iii.2004 (F.W. and S.K. Gess), 1 ♀, 1 ♂ (at water) [AMGS]; same locality, 28.iii.2004 (F.W. and S.K. Gess), 1 ♀ (visiting white flowers [of] *Boerhavia hereroensis* Heimerl., Nyctaginaceae) [AMGS]; road D2344 WNW [of] Omatjete (20.57S, 15.14E), 15.iii.2004 (F.W.

and S.K. Gess), 1 ♀; Barby 26, Bethanie (SE2516DC) [25.51S, 16.33E], 2–7.x.1972 (collector ?) (F9244), 1 paratype ♂ [NMNW]; 36 km on [road] C13 from Helmeringhausen (26.05S, 16.38E), 9.iii.1999 (F.W. and S.K. Gess), 1 ♀, 1 ♂ (both visiting yellow flowers of *Deverra denudata* (Viv.) Pfisterer & Podl., Apiaceae) [AMGS]; 18 km from Ariamsvlei on road to Aroab [circa 28.00S, 19.43E], 14.v.1973 (C.F. Jacot-Guillarmod), 1 Paratype ♀ [AMGS]. SOUTH AFRICA: NORTHERN CAPE: on road to Richtersveld National Park bet[ween] Annis and Dabie rivers (28.20S, 16.55E), 20.ix.1997 (F.W. and S.K. Gess), 1 ♀, 5 ♂♂ (4 ♂♂, of which 1 stylopized, visiting deep pink flowers of *Hermbsstaedtia glauca* (Wendl.) Reichb. ex Steud., Amaranthaceae) [AMGS]. WESTERN CAPE: Merweville Distr[ict] [32.40S, 21.31], ii.1948 (H. Zinn), 1 paratype ♂ [SAMC]; Dikbome, Merweville, Koup [32.54S, 21.22E], x.1952 (Mus. Exped.), 2 paratype ♂♂ [AMGS]; Merweville, Laingsburg Distri[ct], i.1959 (H. Zinn), Holotype ♂, 1 paratype ♀ [SAMC]; Prince Albert Dist., Tierberg (Study Site) (33.10S, 22.16E), 16.xi.1994 (F.W. and S.K. Gess), 1 ♂ (claws bearing pollinia of *Gomphocarpus filiformis* (E. Mey.) D. Dietr., Asclepiadaceae) [AMGS].

Geographical distribution. The Nama-Karoo of the Northern Cape and Namibia (Fig. 12a).

Floral associations. Recorded from four plant families: Amaranthaceae (*Hermbsstaedtia glauca* (Wendl.) Reichb. ex Steud.); Apiaceae (*Deverra denudata* (Viv.) Pfisterer & Podl.); Apocynaceae (formerly Asclepiadaceae, *Gomphocarpus filiformis* (E. Mey.) D. Dietr.; Nyctaginaceae (*Boerhavia hereroensis* Heimerl.).

Nesting. Unknown.

Prey. Unknown.

***Bembix liturata* R. Turner**

http://species-id.net/wiki/Bembix_liturata

Fig. 11b

Bembex liturata R. Turner, 1917a: 440, ♂, ♀ (Syntypes, South Africa, Eastern Cape, Willowmore, in BMNH); Arnold 1929: 370, figs 34, 34a–c, pl. 6, figs 26, 27, ♂, ♀ (in revision of southern Africa Sphecidae); Arnold 1930: 21 (in checklist of Afro-tropical Sphecidae); Guiglia 1931: 157 (Eritrea, Dankalia, Gaarre N Assaab).

Bembex liturata R. Turner, R. Bohart & Menke, 1976: 547 (in checklist of world Sphecidae); Pulawski 2013: 41 (in catalogue of world Sphecidae sensu lato).

Note. This species was described by Turner from Willowmore and recorded from the same locality by Arnold.

In the females the sixth tergite is not always black (as stated in Arnold's key) but may be ferruginous or even yellow at the apex, in which case the general appearance is much like that of *B. capensis*. Such specimens are, however, distinguishable by the pale markings on the tergite being yellowish white (not yellow), by the greater amount of yellow and lesser amount of ferruginous (if any) on the sterna, by the shape of the black mark on the clypeus, by the more gracile form of the second flagellar segment, and by

the fact that the labrum at the baso-lateral angles (and sometimes laterally) is finely but distinctly pilose (almost glabrous in *capensis*).

The subspecies *flavopicta* Arnold cannot be upheld as the material examined shows that the species may vary considerably in the degree of development of the light markings. Specimens from Willowmore are usually melanistic, *flavopicta* has the light markings well developed, specimens from Merveville are intermediate.

Material examined. ZIMBABWE: Matetsi [18.15S, 25.55E], 7.ix.1934 (R.H.R. Stevenson), 1 ♂; same locality and collector, 9.ix. 1934, 1 ♂; same locality and collector, 12.ix.1934, 1 ♀; same locality and collector, 28.x.1934, 1 ♀. NORTHERN CAPE: ?.... Kloof, Fraserburg [31.55S, 21.31E], xi.1935 (Mus. Staff), 1 ♂ [SAMC]. WESTERN CAPE: Liebendal [Station] [31.36S, 18.24E], xi.1953 (S.A.M.), 1 ♀ [SAMC]; Murraysburg Dist[ri]ct [circa 31.58S, 23.47E], xi.1935 (Mus. Staff), 2 ♂♂ [SAMC]; Bushmans Riv[er], Letjiesbosch, Koup [32.34S, 22.16E], xi.1935 (Mus. Staff), 1 ♀ [SAMC]; Merweville Distr[ict] [32.40S, 21.31], i-ii. 1947 (H. Zinn), 3 ♀♀, 2 ♂♂ [SAMC]; Dikbome, Merweville, Koup [32.54S, 21.22E], i.1953 (H. Zinn), 7 ♀♀, 6 ♂♂ [SAMC]; Rietbron [32.54S, 23.08E], 11.i.1965 (H.N. Empey), 1 ♀ [AMGS]; Nieuvelde Escarpment, Rietvlei [32.20S, 21.30E], i.1949 (Zinn-Hesse Mus. Exp.), 1 ♂ [SAMC]; Rooinek [Pass], Laingsberg Distr. [33.20S, 20.52E], i.1949 (Zinn-Hesse Mus. Exp.), 1 ♀, 1 ♂ [SAMC]; 43 km ENE of Ceres on road to Sutherland [33.12S, 19.44E], 2-3. xii.1989 (R.W. Gess), 2 ♂♂ (1 ♂ on flowers of *Athanasia* spp., Asteraceae); same locality and dates (H.W. Gess), 1 ♀ [AMGS]; Oudtshoorn, Onverwacht (33.37S, 22.14E), 9.-12.xii.1986 (F.W. Gess), 3 ♀♀; same locality and dates (R.W. Gess), 2 ♂♂ (on flowers of *Acacia caffra* (Thunb.) Willd., Fabaceae) [AMGS]; EASTERN CAPE: Aberdeen [32.28S, 24.02E], xi.1935 (Mus. Staff), 1 ♀ [SAMC]; Willowmore [33.15S, 23.30E], 1.xi.1899 (Brauns), 1 ♂ [SAMC ex NMBZ]; same locality and collector, 10.i.1900, 1 ♀ [DMSA], 17.xi.1916, 1 ♀ [SAMC ex NMBZ], no date, 1 ♂ [SAMC ex NMBZ].

Geographical distribution. Known principally from the southern Nama-Karoo of South Africa. The single record from Zimbabwe suggests that further records are required to establish the distribution pattern. (Fig. 12b)

Floral associations. Recorded from two plant families: Asteraceae (*Athanasia* spp.); and Fabaceae (Mimosoideae, *Acacia caffra* (Thunb.) Willd.).

Nesting. Unknown.

Prey. Unknown.

Bembix loupata J. Parker

http://species-id.net/wiki/Bembix_loupata

Fig. 11c

Bembix loupata J. Parker, 1929: 73, pl. 10, figs 123-126, ♂, ♀ (Holotype, ♂, Tanganyika [Tanzania], Kanoga, in ZMHB); Lohrmann 1948: 448 (member of *mediterranea* species group; R Bohart and Menke 1976: 547 (in checklist of world Sphecidae); Pulawski 2013: 42 (in catalogue of world Sphecidae sensu lato).

Bembex loupata Parker & Arnold, 1931: 211, figs 47, 47a, 47b (original description copied).

Material examined. ZIMBABWE: Sawmills [19.35S, 28.02E], 31.x.1919 (G. Arnold) 1 ♂ [AMGS]; Sawmills, 12.xii.1926 (Rhodesian Museum) 1 ♂; Victoria Falls [17.55S, 25.50E], 19.xi.1920 (G. Arnold) 1 ♂ [both SAMC ex NMBZ].

Geographical distribution. Known from Tanzania (Kanoga and Ukerewe Island) and Zimbabwe (Fig. 12c). Clearly more records are required to establish a distribution pattern.

Flower associations. Unknown.

Nesting. Unknown.

Prey. Diptera: Bombyliidae and Sarcophagidae (*Sarcophaga* sp.).

Bembix massaica Cameron

http://species-id.net/wiki/Bembix_massaica

Fig. 10

Bembex massaica Cameron, 1908: 290, ♂, ♀ (Syntypes, Tanzania, Mt Meru lowlands, Ngare na nyuki, and Tanganyika [Tanzania], Usambara Mts, Mombo, in NMBZ); Turner 1917a: 439 (as synonym of *Bembex forcipata*); Arnold 1929: 365 (in revision of southern African Sphecidae); Arnold 1930: 21 (in checklist of Afrotropical Sphecidae); Arnold 1933: 359 (Ethiopia).

Bembix massaica Cameron & Guiglia, 1943: 75 (Ethiopia, Gamo Gofa, Caschei); R. Bohart and Menke 1976: 546 (in checklist of world Sphecidae, as synonym of *Bembex forcipata*); Pulawski 2013: 44 (in catalogue of world Sphecidae sensu lato, as valid species).

Note. Described by Cameron (1908) from Tanganyika [Tanzania]. Arnold (1929) recorded the species from East Africa and Rhodesia [Zimbabwe] and (1951) from Ethiopia.

Material examined. KENYA: Luvia Island, Lake Victoria, 14.iv.1952 (Nat. Museum S. Rhodesia) 2 ♀♀. DEMOCRATIC REPUBLIC OF THE CONGO (DRC): Lake Mweru [9.10N, 28.30E], Lunchinda River, 15.ii.1953 (H.D. Brown) 1 ♀ [AMGS]. ZIMBABWE: Balla-Balla [Mbalabala] [20.45S, 29.05E], 1.iv.1945 (Nat. Museum S. Rhodesia) 1 ♀; Bembesi 20.00S, 28.56E], 4.i.1913 (G. Arnold) 2 ♀♀; Bulawayo [20.07S, 28.32E], 20.vi.1923 (R. Stevenson) 1 ♀, 28.x.1923 (R. Stevenson) 1 ♀, 27.xii.R.H.R. Stevenson) 1 ♀, 28.xii.1924 (R.H.R. Stevenson) 1 ♀ [all SAMC ex NMBZ]; Redbank [20.1S, 27.46E], 3.xii.1917 (G. Arnold) 1 ♂; Salisbury [now Harare] [17.48S, 31.03E], ii.1932 (Dept. Agric.) 1 ♂; Sawmills [19.35S, 28.02E], 11.iv.1941 (Rhodesia Museum) 1 ♂; Selukwe [19.41S, 29.59E], xii.1940 (??) 1 ♂, 2.i.1941 (??) 1 ♂; Turk Mine [19.44S, 28.48E], xi.1958 (Nat. Museum S. Rhodesia) 2 ♂♂, 2 ♀♀, 24.xi.1958 (Nat. Museum S. Rhodesia) 2 ♂♂, 1 ♀; Umguza R. [20.1S, 30.51E], 24.v.1923 (Swinburne and Stevenson) 2 ♂♂; Umtali [Mutare] [18.57S, 32.40E], ii.1917 (Rhodesia Museum) 1 ♂ [all SAMC ex NMBZ].

Geographical distribution. Known from Ethiopia and the DRC in the north to Zimbabwe. Not recorded south, east or west of Zimbabwe.

Flower associations. Unknown.

Nesting. Unknown.

Prey. Unknown.



Figure 10. *Bembix massaica*, female, male. (approximate length of female: 15.5 mm).

***Bembix melanopa* Handlirsch**

http://species-id.net/wiki/Bembix_melanopa

Fig. 11d

Bembex melanopa Handlirsch, 1893: 797, pl. 2, fig. 10, pl. 7, fig. 7, ♂, ♀ (Syntypes, Mozambique, Delagoa Bay [Maputo], in ZMHB; Natal [KwaZulu-Natal], South Africa, in MHNG); Bingham 1902: 211 (South Africa and Malawi); Dalla Torre 1897: 508 (in catalog of world Hymenoptera); Kohl 1906: 212 (Socotra Island, Yemen); Arnold 1929: 354, figs 21, 21a-c, pl. 6, figs 16, 17, ♂, ♀ (in revision of southern African *Bembix*); Arnold 1930: 21 (in checklist of Afrotropical Sphecidae).

Bembix melanopa Handlirsch & Parker, 1929: 115 (in revision of Stizini and Bembicini); Cuthbertson 1939: 1 (prey and nest parasite, *Craticulina tabaniformis* (Fabricius), Sarcophagidae); 115; Lohrmann 1939: 142 (member of *melanopa* group); Ulleyt and De Vries 1940 (prey); Guiglia 1943: 75 (Ethiopia); 1950: 239 (Ethiopia); Leclercq 1955: 407 (Rwanda); R. Bohart and Menke 1976: 547 (in checklist of world Sphecidae); Gess 1981: 21 (nesting and prey); Gess 1986: 153–154, 158 (plants visited, nesting and prey); Gess and Gess 1988: 246–247, Fig. 14.19 (habitus, habitat); Gess and Gess 1998: 351, Fig. 22.18, 22.13 (habitus, habitat); Gess and Gess 2003: 124 (flower visiting records); Pulawski 2013: 46 (in catalogue of world Sphecidae sensu lato).

Material examined. KENYA: Malindi, Casuarina Point (03.14S, 40.00E), 7–20.i.1987 (A.J. Weaving), 2 ♀♀ [AMGS]; Malindi (03.14S, 40.06E), 25.x.- 16.xi.1989 (A. Weaving), 1 ♀ [AMGS]. MALAWI: Salima Bay [13.47S, 34.26E], Lake Nyasa, 5.xi.1943 (Nat. Museum S. Rhodesia), 1 ♀ [SAMC ex NMBZ]. ZIMBABWE (SOUTHERN RHODE-

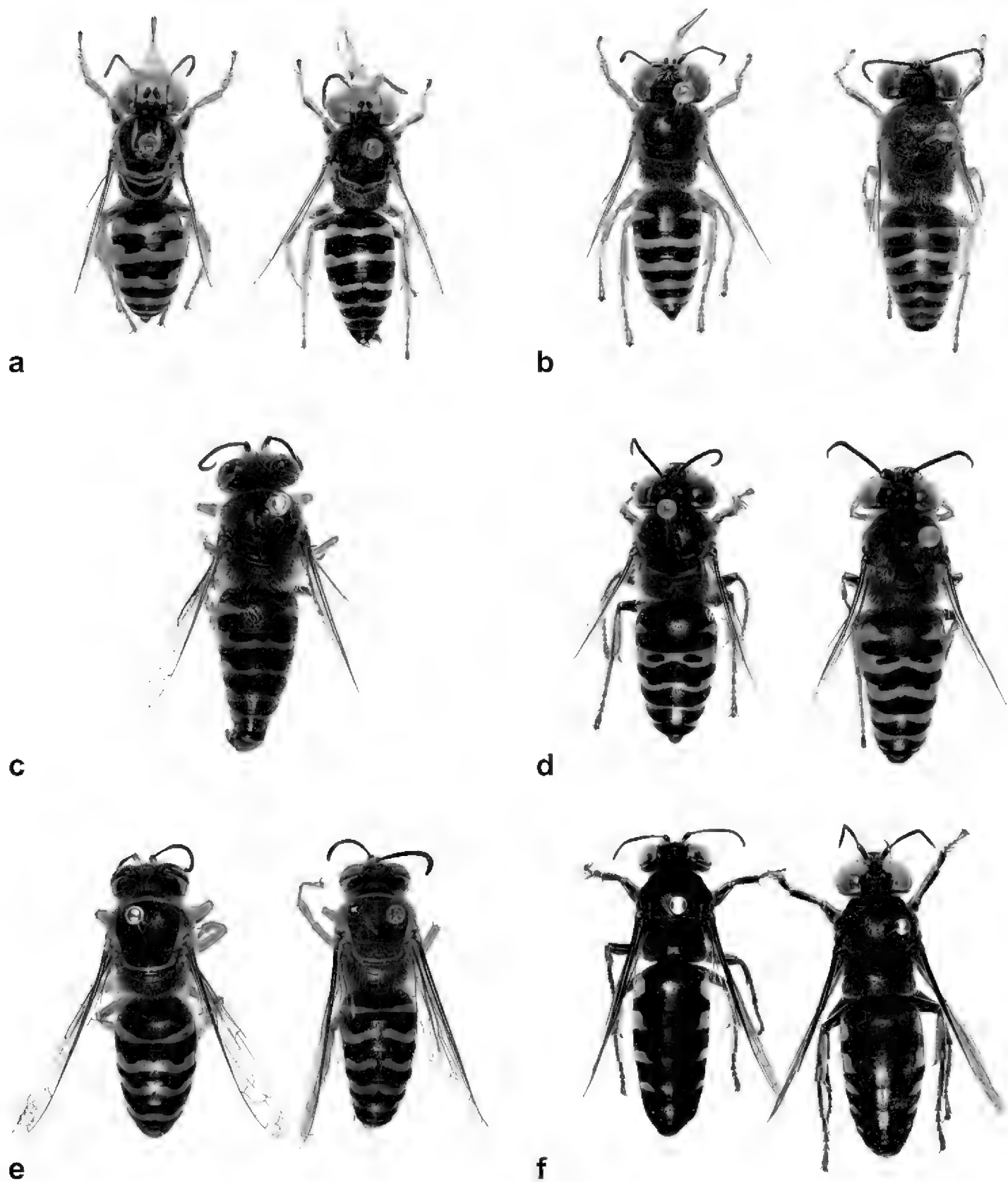


Figure 11. *Bembix* spp.: **a** *karroensis*, female, male **b** *liturita*, female, male **c** *loupata*, male **d** *melanopa*, female, male **e** *moebii*, female, male **f** *monedula*, female, male. (approximate lengths of – females: **a** 15.5 mm; **b** 16 mm; **d** 15.5 mm; **e** 21 mm; **f** 24 mm – male: **c** 15 mm).

SIA): Chigudu Farm, Myurwi (1630DD) [16.58S, 30.55E], 14.i.1985 (A.J. Weaving), 1 ♀ [AMGS]; T[relawney] R[esearch] S[tation], Harare [17.32S, 30.28E], 21.xii.1953 (N.J. Myers), 1 ♀; same locality and collector, 6.i. 1954, 1 ♀, 22.i. 1954, 1 ♀, 2 ♂♂ [AMGS]; S[alis]b[ur]y [17.48S, 31.03E], i.1954 (D. Evans), 1 ♀ [AMGS]; Lake Mcllwaine, Salisbury [17.55S, 30.46E], 26.xii.1953 (A.D. Caley), 1 ♀ [AMGS]; Sanyati Valley [17.58S, 29.17E], ix-x.1925 (R.H.R. Stevenson), 1 ♂ [SAMC ex NMBZ]; Inyanga

[18.16S, 32.43E], xii.1920 (Rhodesia Museum), 1 ♂ [SAMC ex NMBZ]; Dett [18.37S, 26.50E], 21.xi.1930 (Rhodesia Museum), 1 ♀ [AMGS]; Gwaai [= Gwai] [19.17S, 27.43E], 14.x.1926 (R.H.R. Stevenson), 1 ♀ [SAMC ex NMBZ]; Sawmills [19.35S, 28.02E], 10.xi.1920 (Rhodesia Museum), 1 ♂ [AMGS]; same locality, 1.iv.1923 (Roy Stevenson), 1 ♂ [AMGS], 14.xi.1924 (R.H.R. Stevenson), 1 ♂, [AMGS], 21.iii.1937 (collector ?), 1 ♀ [SAMC ex NMBZ]; Umguz R[iver] [19.42S, 28.25E], 24.v.1923 (Swinburne and Stevenson), 1 ♂ [SAMC ex NMBZ]; Bulawayo [20.07S, 28.32E], 28.iii.1923 (R. Stevenson), 1 ♀ [AMGS]; same locality and collector, 29.x.1923, 1 ♀ [AMGS]; Khami [20.15S, 28.28E], 28.x.1928 (Rhodesia Museum), 1 ♀ [SAMC ex NMBZ]; Matopos [20.35S, 28.30E], 11.xi.1924 (Rhodesia Museum), 1 ♀ [SAMC ex NMBZ]. LESOTHO: Mamathes, ii.1940 [29.08S, 27.51E], 1 ♀ [AMGS]. SOUTH AFRICA: NORTH WEST PROVINCE: Vryburg [26.55S, 24.45E], 29.ii.1980 (Empey), 1 ♀ [AMGS]; Schweitzer-Reneke [27.11S, 25.18E], 27.ii.1979 (F. Herbst), 2 ♀♀ [AMGS]; Buffelspoort Dam, Western Transvaal [25.47S, 27.29E], 7.xii.1968 (F.J. Herbst), 1 ♀, 1 ♂ [AMGS]; Buffelspoort Dam, Western Transvaal [25.46S, 27.29E], 27.xii.1970 (Empey), 1 ♀, 5 ♂♂ [AMGS]; Buffelspoort Dam, 7.i.199 (F.J. Herbst), 1 ♂ [AMGS]. LIMPOPO. Messina [now Musina] [22.20S, 30.05E], 17.vii.1962 (Empey), 1 ♂ [AMGS]; Sabie Riv. Bung. [circa 25.10S, 30.48E], 30.xii.1962 (Empey), 1 ♀, 3 ♂♂ [AMGS]; Afguns, Ellisras [now Lephalale] Distr. [23.50S, 27.41E], Nylstroom [now Modimolle] [24.42S, 28.22E], 16–31.xii.1921 (G.P.F.v. ?); Ellisras [now Lephalale] [23.40S, 27.46E], 17.xi.1962 (Empey), 1 ♀, 1 ♂ [AMGS]; Ellisras [now Lephalale] [23.40S, 27.46E], 24.xii.1973 (Empey), 2 ♀♀ [AMGS]; Afguns, Ellisras [now Lephalale] Distr. [23.50S, 27.41E], 3.iv.1972 (Empey), 2 ♂♂ [AMGS]; Hope, Ellisras [now Lephalale] [23.40S, 27.45E], 11.xi.1967 (F.J. Herbst), 1 ♀ [AMGS]; Hope, Ellisras [now Lephalale], 3.iv.1972 (Empey), 1 ♂ [AMGS]; NW [of] Ellisras [now Lephalale] [circa 23.40S, 27.46E], 17.xi.1962 (Empey), 3 ♂♂ [AMGS]; Rust de Winter [25.12S, 28.37E], 8.ii.1975 (Empey), 1 ♀, 1 ♂ [AMGS]; Naboomspruit [24.32S, 28.40E], 8.i.1964 (Empey), 1 ♂ [AMGS]. MPUMALANGA: Komatipoort [25.25S, 31.55E], 11.x.1971 (E. Holm), 1 ♀ (Malaise trap) [AMGS]. GAUTENG: Pretoria North sandpits [25.44S, 28.07E], 26.x.1947 (C. Jacot-Guillarmod), 3 ♀♀, 5 ♂♂ (1 ♀, 5 ♂♂ with pollinia of *Asclepiadaceae* on claws); Pretoria North [25.40S, 28.10E], 29. xi. 1964 (Empey), 1 ♀; Johannesburg West [26.13S, 28.02E], 11.i.1959 (Empey), 1 ♀; Benoni [26.11S, 28.18E], 17.xii.1962 (Empey), 2 ♀♀, 4 ♂♂; Randburg [26.04S, 27.58E], 17.xii.1962 (Empey), 1 ♂; Florida [26.11S, 27.55E], 14.ii.1959 [Herbst], 1 ♀; Strubens Valley, Florida [26.31S, 29.57], 17.ii.1962 (Empey), 1 ♀, 1 ♂; Florida Hills [26.10S, 27.56E], 19.iii.1960 (Empey), 4 ♀♀; Florida Hills, 10.iii.1961 (Empey), 2 ♀♀; Florida Hills, 2.iv.1961 (Empey), 1 ♀; Olifantsfontein [25.58S, 28.14E], 3.i.1970 (Empey), 1 ♀. KWAZULU-NATAL: Ndumu Game Reserve Rest Camp (2632Cd) [26.04S, 32.26E] (95m), 23–29.xi.1977 (Brothers and Guillarmod), 1 ♀; Lake Sibaya [27.23S, 32.41E], 13–25.iii.1968 (D.J. Brothers), 1 ♀ 3 ♂♂; Lake Sibaya (27.23S, 32.41E), 4–8.ii.1991 (A. Weaving), 3 ♀♀, 1 ♂; Mkuze Reserve (2732 Cb) [circa 27.39S, 32.15E], 3–11.x.1977 (J.G.H. Londt), 1 ♀; Mkuze Game Reserve, 1–2. iv.1984 (A.J. Weaving), 1 ♀; False Bay, [Lake St Lucia] (27.56S, 32.23E), 24.ii–4.iii.1990 (A. Weaving), 2 ♂♂; False Bay, Lake St Lucia, 2–21.ii.1991 (A. Weaving), 1 ♀, 2 ♂♂; same locality, 27.i.–2.ii.93 (A. Weaving),

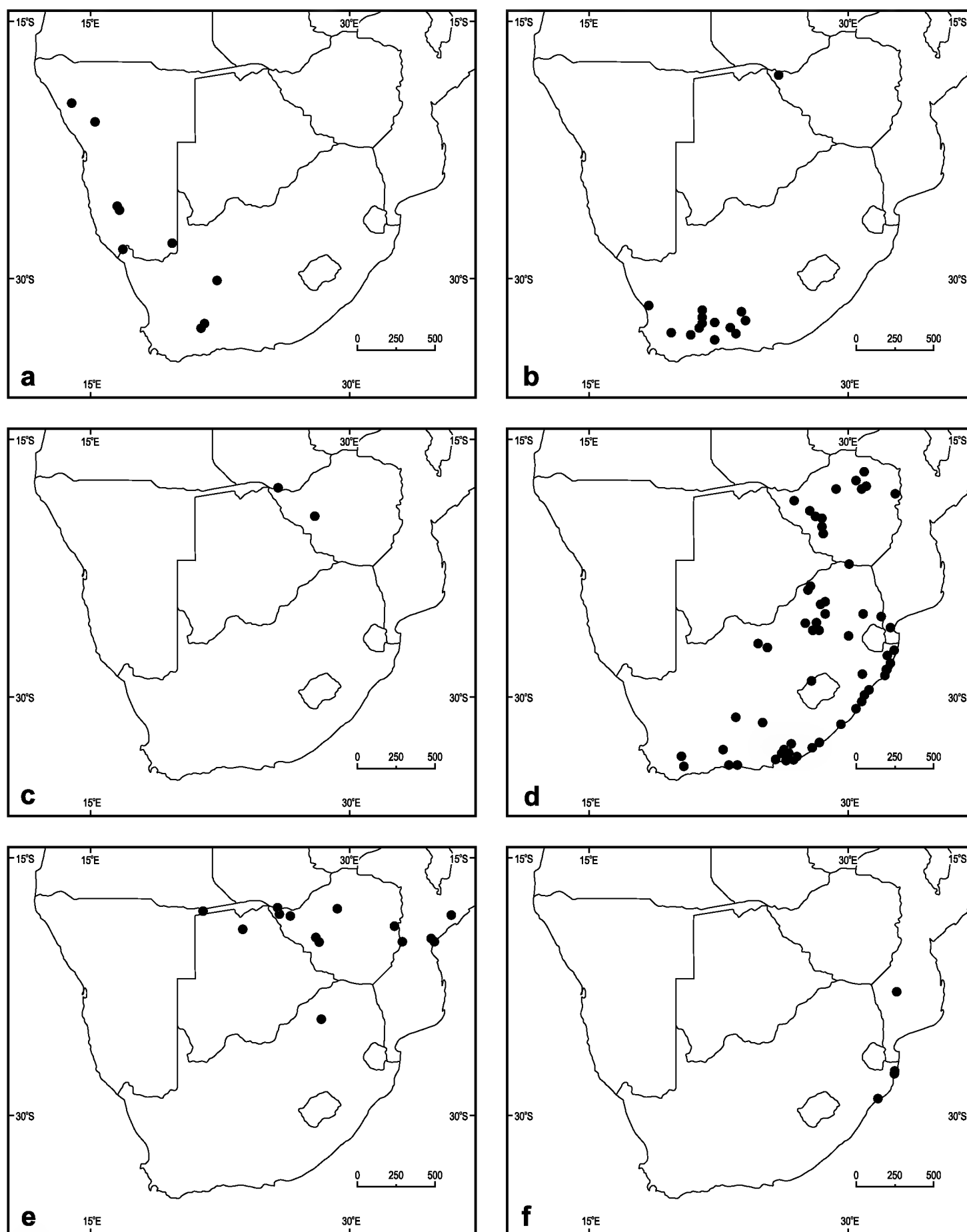


Figure 12. Distributions of collection records of *Bembix* spp: **a** *karroensis* **b** *liturata* **c** *loupata* **d** *melanopa* **e** *moebii* **f** *monedula*.

2 ♀♀; Fannies Is[land], [Lake St Lucia] (28.06S, 32.26E), parkland, 16–19.iii.1990 (A. Weaving), 2 ♂♂; same locality, 20–24.ii.1990 (A. Weaving), 1 ♀; Fannies Isl[and], Lake St Lucia, 30.i-2.ii.1991 (A. Weaving), 1 ♀; Umfolosi R. Bridge, 7 km SW Mtubatuba [28.27S, 32.09E], 1.xii.1977 (Brothers & Guillardmod), 2 ♂♂; Mfongosi [28.43S, 30.48E],

3.iii.1914 (W.E. Jones), 1 ♂; Richardsbaai [28.48S, 32.06E], 15.ii.1972 (A. Prinsloo), 1 ♀; Umhloti [29.39S, 31.07E], 5.x.1947 (C. Jacot-Guillarmod), 1 ♂; Umhlanga [29.43S, 31.06E], iv.1941 (Nat. Museum S. Rhodesia), 1 ♀; [AMGS], 1 ♂ [SAMC]; Mayville, Durban [29.51S, 30.59E], 14.x.1972 (F. Herbst), 2 ♂♂; same locality, 12.xi.1972 (F. Herbst), 1 ♂; Manor Gardens, Durban [29.53S, 31.03E], 5.xi.1968 (F.J. Herbst), 2 ♀♀; Hillary, Durban [29.53S, 30.57E], no date [F. Herbst], 1 ♀, 1 ♂; Umbilo, Durban [29.54S, 30.59E], 8.iv.1952 (C. Jacot-Guillarmod), 1 ♂; same locality, 19.x.1955 (C. Jacot-Guillarmod), 1 ♂; Stainbank Nature Reserve, Durban [29.55S, 30.57E], i.1975 (F. Herbst), 1 ♂; Point, Durban [29.55S, 31.01E], 5.xi.1972 (F.J. Herbst), 1 ♀; Isipingo [30.00S, 30.57E], 5.ii.1976 (D.J. Brothers), 2 ♀♀; 2 km S [of] Isipingo, 18.xii.1975 (D.J. Brothers), 5 ♀♀; Amanzimtoti [30.02S, 30.58E], 15.iii.70 (F.J. Herbst), 1 ♀; Widenham [30.13S, 30.48E], 4.iv.1982 (A. Weaving), 2 ♀♀; same locality, 7.iv.1982 (A. Weaving), 1 ♀, 25.iii.1984 (A. Weaving), 1 ♀, 2 ♂♂, 7–8.iv.1984 (A. Weaving), 2 ♀♀, 27.ii.–1.iii.1985 (A. Weaving), 1 ♂; Scottburgh [30.15S, 30.47E], 11.xi.1972 (F. Herbst), 1 ♀; Umtentwini [30.42S, 30.28E], 20.iv.1973 (Empey), 6 ♂♂; Port Shepstone [30.44S, 30.28E], 15.ii.1972 (Empey), 1 ♀; St. Michaels [30.50S, 30.23E], 14.i.1953 (E.McC. Callan), 2 ♀♀, 1 ♂ [all AMGS unless otherwise indicated]. EASTERN CAPE: Middelburg [31.30S, 25.00E], 3.ii.1957 (E.McC. Callan), 2 ♀♀ [AMGS]; Port St. Johns [31.38S, 29.33E], iii.1967 (F.W. and S.K. Gess), 2 ♀♀, 5 ♂♂ [SAMC]; Morgan's Bay [32.42S, 28.20E], 30.iii. – 4.iv.1989 (F.W. and S.K. Gess), 1 ♀; Fort Beaufort [32.46S, 26.40E], 20.i.1960 (C. Jacot-Guillarmod), 3 ♀♀, 1 ♂ (1 ♀ with prey: Muscidae, Diptera); East London [33.00S, 27.55E], 10.xii.1975 (F.J. Herbst), 2 ♂♂; Carlisle Bridge [33.05S, 26.14E], 14.i.1961 (Empey), 1 ♀, 3 ♂♂; Gxulu River, E[ast L]ondon [33.07S, 22.44E], 15.xii.1970 (F.W. Gess), 2 ♀♀; Kransdrift, Grahamstown [33.09S, 26.32E], 8.ii.1981 (D.W. Gess), 1 ♀; Willowmore [33.15S, 23.30E], i.1922? (Brauns), 1 ♂; Alicedale [33.15S, 26.04E], 2.xii.1970 (F.W. Gess), 1 ♀; Hilton, Grahamstown [33.15S, 26.20E], 2.xii.1977 (D.W. Gess), 1 ♀; same locality, 20.xii.1977 (D.W. Gess), 2 ♀♀, 2.i.1978 (D.W. Gess), 2 ♀♀, 1 ♂, (R.W. Gess), 1 ♀, 10.i.1978 (D.W. Gess), 1 ♂, 12.i.1978 (D.W. Gess), 1 ♀, 13.i.1978 (D.W. Gess), 2 ♀♀, (F.W. Gess), 1 ♂, 17.i.1978 (D.W. Gess), 1 ♀, 18.i.1978 (D.W. Gess), 1 ♂, 24.i.1978 (D.W. Gess), 1 ♂, 9.ii.1978 (F.W. Gess), 1 ♂, 16.ii.1978 (F.W. Gess), 1 ♀; Grahamstown [33.19S, 26.31E], 8.viii.1957 (A.M. Bennett), 1 ♂; Belmont Valley, Grahamstown [33.19S, 26.35E], 17–25.i.1970 (J.G.H. Londt), 1 ♀ (on flowering *Foeniculum vulgare* Mill., Apiaceae); same locality, 20.i.1970 (F.W. Gess), 1 ♀ (on flowering *Foeniculum vulgare*); same locality, 23.i.1970 (F.W. Gess), 1 ♂ (on flowering *Foeniculum vulgare*); Riet River Mouth, near Port Alfred [33.33S, 27.01E], 19.ii.1978 (D.W. Gess), 1 ♂; same locality, 5.iii.1972 (F.W. Gess), 1 ♀; same locality, 28.i.1973 (F.W. Gess), 3 ♂♂; same locality, 4.iii.1973 (F.W. Gess), 2 ♀♀; Port Alfred [33.36S, 26.55E], 5.iv.1958 (E.McC. Callan), 1 ♀; same locality, 27.iv.1958 (E.McC. Callan), 1 ♀; Salt Vlei, Port Alfred [33.37S, 26.52E], 31.i.1960 (E.McC. Callan), 1 ♀; same locality, 16–17.iv.1979 (E.McC. Callan), 2 ♀♀; 5 km N of Alexandria on road to Salem [33.37S, 26.24E], 16.i.1984 (D.W. Gess), 2 ♀♀ (on flowering *Foeniculum vulgare*); Kasouga Dunes [33.39S, 26.44E], xii.[19]54 (Cooke), 1 ♂; Cannonvale (33.40S, 25.47E), 18.xii.1987 (A.J. Weaving), 1 ♂; Alexandria Forest [33.41S, 26.23E], 16.i.1981 (F.W. Gess), 1 ♂;

Kenton-on-Sea [33.42S, 26.38E], 21.xii.1979 (Empey), 1 ♀, 4 ♂♂; Boknes (33.43S, 26.35E), 9.i.1986 (F.W., D.W. and R.W. Gess), 3 ♀♀; Alexandria Forest to Cannon Rocks, sandbank on roadside [33.45S, 26.24E], 16.i.1984 (F.W. Gess), 1 ♀ [all AMGS]. WESTERN CAPE: Natures Valley, Tsitsikama Forest [33.59S, 23.34E], 28.xii.1966 (A Jacot-Guillarmod), 1 ♂; Natures Valley, Tsitsikama Forest [33.59S, 23.34E], 28.xii.1966 (C. Jacot-Guillarmod), 4 ♀♀ (1 ♀ with prey: *Philoliche (Phara) flavipes* (Macq.) 1 ♀, Tabanidae); Knysna, Leisure Island Beach (34.02S, 23.03E), 14.xii.1980 (P.M. Croeser), 1 ♂; 7 km S [of] Swellendam, Bontebok National P[ar]k (3420Ab) [34.04S, 20.27E], 9.iii.1979 (L. Braak), 1 ♀ (“ex Springbok carcass”) [undoubtedly hunting flies at the carcass –FWG]; Bloutoring (33.29S, 20.19E), 3.xii.1986 (S.K. Gess), 1 ♂ (on flowers of white “mesem”, Aizoaceae, Mesembryanthema).

Geographical distribution. A widespread species known from Kenya south to the southern Eastern Cape. Coming down to the coastal dunes but not restricted to the coast (Fig. 12d).

Floral associations. Recorded from four plant families: Apiaceae (*Foeniculum vulgare* Mill.); Apocynaceae (formerly Asclepiadaceae); Asteraceae (*Athanasia trifurcata* (L.) L.); and Aizoaceae (Mesembryanthema, “mesem”).

Nesting. . Three nests recorded at Hilton, near Grahamstown, Eastern Cape - all single celled, sloping burrows in sloping friable soil, the main shaft ended in a spur.

Prey. Recorded taking seven families of Diptera: Tabanidae, Bombyliidae, Syrphidae, Muscidae, Calliphoridae, Sarcophagidae, and Tachinidae.

***Bembix moebii* Handlirsch**

http://species-id.net/wiki/Bembix_moebii

Fig. 11e

Bembex möbii Handlirsch, 1893: 775, pl. 2, fig. 2, pl. 7, fig. 1, ♂, ♀, (Syntypes, Mozambique, Delagoa Bay [Maputo], in ZMHB); Dalla Torre 1897: 508 (in catalogue of world Hymenoptera).

Bembex moebii Handlirsch & Arnold, 1929: 343, figs 13, 13a, pl. 6, fig. 7, ♂, ♀ (nesting situation) (in revision of southern African Sphecidae); Arnold 1930: 21 (in checklist of Afrotropical Sphecidae).

Bembex mobii (sic) Handlirsch & Parker, 1929: 83 (in revision of Stizini and Bembicini), ♂.

Bembex moebii Handlirsch & Giordani Soika, 1939: 105 (Mai Daro, Eritrea); R. Bohart and Menke 1976: 547 (listed in checklist of world Sphecidae); Gess 1986: 154, 158 (prey); Pulawski 2013: 49 (in catalogue of world Sphecidae sensu lato).

Bembex testaceicauda Cameron, 1910: 144, ♀ (Holotype or syntype, South Africa, former Transvaal, no locality, in TMSA); Brauns 1911: 241 (synonymised with *Bembex moebii*).

Note. This species was described by Handlirsch (1893) from Delagoa Bay (Mozambique). Arnold (1929) recorded the species from Delagoa Bay and from four localities

in Rhodesia (now Zimbabwe): Victoria Falls, Sawmills, Sabyati Valley and Umtali. Parker (1929) doubtfully referred to this species a specimen labelled "Bosum, 22-4-14, Tessman". The synonym, *B. testaceicauda*, was described by Cameron (1910) from the neighbourhood of Pretoria (Gauteng).

Material examined. TANZANIA: Old Shinyanga [3.34S, 33.24E], 7.xii.1954 (E. Burtt), 1 ♀ [SAMC ex NMBZ]. ZAMBIA: Abercorn [now Mbala] [8.50S, 31.24E], x.1943 (Nat. Museum S. Rhodesia), 1 ♀, 1 ♂ [SAMC ex NMBZ]; same locality, viii.1945 (Nat. Museum S. Rhodesia), 1 ♂ [SAMC ex NMBZ]; Kafue Hoek (*sic*), [15.44S, 28.10E], 15.xii.1955 (C.B. Cottrell), 1 ♀ [AMGS]. ZIMBABWE: Victoria Falls [17.55S, 25.50E], 15.xi.1920 (G. Arnold), 1 ♀ [SAMC ex NMBZ]; same locality, 18.xi.1920 (Rhodesia Museum), 1 ♂ [AMGS]; Katambora, Zambesi R. [?], ix.1957 (Nat. Museum S. Rhodesia), 2 ♂♂ [1 ♂ SAMC ex NMBZ; 1 ♂ AMGS]; Sanyati Valley [17.58S, 29.17E], ix.-x.1925 (R.H.R. Stevenson), 5 ♂♂ [2 ♂♂ SAMC ex NMBZ; 3 ♂♂ AMGS]; same locality, ix.-xii.1925 (R.H.R. Stevenson), 2 ♂♂ [1 ♂ AMGS, 1 ♂ SAMC ex NMBZ]; Matetsi [18.15S, 25.55E], x.1933 (R.H.R. Stevenson), 1 ♀ [SAMC ex NMBZ]; same locality, xii.1935 (Nat. Museum S. Rhodesia), 1 ♂ [SAMC ex NMBZ]; Wankie [18.20S, 26.30E], 24.xii.1946 (collector undecipherable), 1 ♀ [AMGS]; Umtali [18.57S, 32.40E], 19.x.1939 (Nat. Museum S. Rhodesia), 1 ♂ [SAMC ex NMBZ]; Sawmills [19.35S, 28.02E], 10.xii.1926 (R.H.R. Stevenson), 1 ♀ [SAMC ex NMBZ]; same data but 11.xii.1926, 1 ♀ [SAMC ex NMBZ]; same locality, 12.xii.1926 (Rhod. Museum), 1 ♂ [SAMC ex NMBZ]; Sawmills Rd, Nyamandhlovu [19.52S, 28.15E], 27.xi.1960 (Nat. Museum S. Rhodesia), 1 ♀ [SAMC ex NMBZ]; Nyamandhlovu [19.52S, 28.15E], xi.1966 (Nat. Museum S. Rhodesia), 1 ♂ [SAMC ex NMBZ]. ANGOLA: Sambo (SE 1216 Cc) [13.03S, 16.08E], 10.x.1972 (no collector recorded), 1 ♀ [NMNW]. BOTSWANA: Khwaai R., 3000' [feet], (19.08S, 23.48E), 80 m[iles] N. of Maun, 10.xii.1968 (Pinhey-Falc. Exp., Nat. Mus. Bulawayo), 1 ♀ [SAMC ex NMBZ]; same data except date 12.xii.1968, 1 ♀. MOZAMBIQUE: Salone Forest, 25 m[iles] S [of] Marromeu [18.20S, 35.56E], 10.xi.1967 (E. Pinhey, Nat. Museum S. Rhodesia), 1 ♂ [SAMC ex NMBZ]; Dondo [19.41S, 34.45E], xii.1960 (Nat. Museum S. Rhodesia), 1 ♀ [SAMC ex NMBZ]; Dondo Forest, 27.x.1963 (Nat. Museum S. Rhodesia), 1 ♀ [SAMC ex NMBZ]; Dondo Forest, 28.x.1963 (Nat. Museum S. Rhodesia), 1 ♂ [SAMC ex NMBZ]; Dondo Forest, Dondo, 13.xi.1967 (E. Pinhey, Nat. Mus. Bulawayo), 1 ♀ [SAMC ex NMBZ]; Beira [19.49S, 34.52E], xii.1960 (Nat. Museum S. Rhodesia), 1 ♀, 1 ♂ [SAMC ex NMBZ]; Hmsezwe River [co-ordinates?], 23.xi.1939 (Nat. Museum S. Rhodesia), 1 ♂ [SAMC ex NMBZ]; Msappa R. [co-ordinates?], 6.x.1950 (Nat. Museum S. Rhodesia), 2 ♀♀, (1 ♀ partial gynandromorph: antennae ♂; body ♀), [SAMC Old Shinyanga ex NMBZ], 3 ♂♂ [AMGS]; Msappa R. (co-ordinates?) Chimanimani Mts [circa 19.52S, 33.06E], 6.x.1950 (Nat. Museum S. Rhodesia), 1 ♂ [SAMC ex NMBZ]. NAMIBIA: Andara, Kavango (SE 1821 Ab) [18.04S, 21.29E], 20–25.vii.1971 (no collector recorded), 3 ♂♂ [NMNW]; Popa Falla, Kavango (18.07S, 21.33E) 26–31.vii.1971 (no collector recorded), 4 ♂♂ [NMNW]. SOUTH AFRICA: LIMPOPO: Waterberg Dist. [24.22S, 28.24E], 1898–99 (v. Jutrzencka), 2 ♀♀ [AMGS]; KWAZULU-NATAL: Ngwxala Hill [? co-ordinates], no date (no collector recorded), 1 ♀ [DMSA].

Geographical distribution. A widespread species in northern southern Africa (Fig. 12e) northwards to Tanzania and recorded from Ethiopia in northeast Africa but not from northwest Africa.

Floral associations. *Unknown.*

Nesting. Nests in shady situations such as “ant-bear” holes and sandy ground under dwellings built on piles.

Prey. Recorded taking one family of Diptera: Tabanidae.

***Bembix monedula* Handlirsch**

http://species-id.net/wiki/Bembix_monedula

Fig. 11f

Bembex monedula Handlirsch, 1893: 789, pl. 2, fig. 8, ♂, ♀ (Syntypes, Delagoa Bay [Maputo], Mozambique, ZMHB); Dalla Torre 1897: 508 (in catalogue of world Hymenoptera); Arnold 1929: 352, fig. 19, pl. 6, fig. 11 (original description translated into English); Arnold 1930: 21 (in checklist of Afrotropical Sphecidae).

Bembix monedula Handlirsch, R. Bohart and Menke 1976: 547 (in checklist of world Sphecidae); Pulawski 2013: 49 (in catalogue of world Sphecidae sensu lato).

Material examined. MOZAMBIQUE: Rikatla [25.48S, 32.51E], v-vi.1963 (F.W. Gess), 1 ♀ [SAMC]. SOUTH AFRICA; KWAZULU-NATAL: Mtunzini [28.57S, 31.45E], 12.ii.1978 (F.J. Herbst), 1 ♀, 6 ♂♂; Sordwana Bay [now Sodwana Bay] [27.32S, 32.41E], 29.iii.1980 (F.J. Herbst), 1 ♂; same locality, 30.iii.1980 (F.J. Herbst), 1 ♀, 1 ♂; Lake Sibayi [now Sibaya] [27.23S, 32.41E], 13–25.iii.1968 (D.J. Brothers), 1 ♀; 5 ♂♂ [all AMGS].

Geographical distribution. From the known records this species seems to be restricted to Mozambique and neighbouring northern KwaZulu-Natal (Fig. 12f), suggesting an eastern semi-tropical distribution.

Floral associations. *Unknown.*

Nesting. *Unknown.*

Prey. *Unknown.*

***Bembix namibensis* Gess**

http://species-id.net/wiki/Bembix_namibensis

Fig. 13a

Bembix namibensis Gess 1986: 138, figs 1–8, male (Holotype, ♂, Namibia, Namib Plain, 15 m[iles] E.[of] Natab, in AMGS); Gess and Gess 2003: 124 (flower visiting records); Pulawski 2013: 50 (in catalogue of world Sphecidae sensu lato).

Female. (hitherto undescribed): Generally very similar to male in puncturation and setation but differing in coloration in that: streak on mesonotum flanking tegula is more

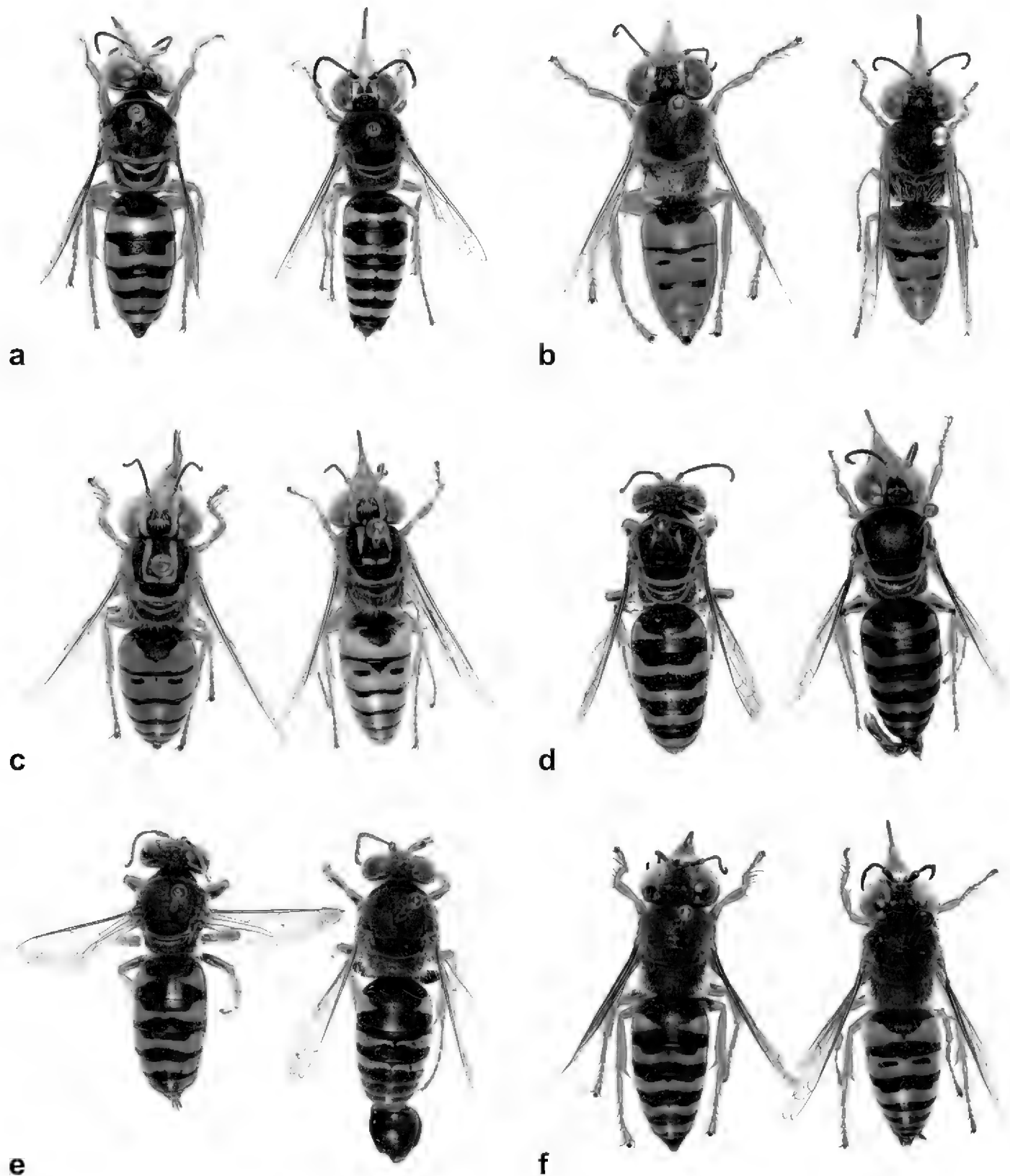


Figure 13. *Bembix* spp.: **a** *namibensis*, female, male **b** *ochracea*, female, male **c** *olivata*, female, male **d** *regnata*, female, male **e** *scaura*, female, male **f** *sibilans*, female, male. (approximate lengths of females: **a** 20.5 mm; **b** 16.5 mm; **c** 15.5 mm; **d** 18 mm; **e** 20 mm; **f** 19.5 mm)

pronounced; mesopleuron, metapleuron and side of propodeum are almost completely yellow; the bands margining scutellum and metanotum are wider and a V-shaped band is present on the dorsum and declivity of the propodeum. Fore tarsus unmodified; sand rake composed of nine long, stiff spines on first tarsomere, two on the second and third tarsomeres and one on the fourth; antennae unmodified (as in male with first flagellomere slightly more than twice length of second).

Length: 23 mm; length of front wing 13 mm; hamuli circa 33.

Material examined. NAMIBIA: near Two Palms, Uniab River (19.53S, 13.54E), 27 & 28.iii.1994, 4 ♂♂ (visiting yellow flowers of *Hirpicium gazanioides* (Harv. Roessler, Asteraceae); circa 17km W [of] Khorixas (20.28S, 14.51E), 16.iii.2004, 1 ♂ (visiting pink flowers of *Hermbstaedtia* sp., Amaranthaceae); Uis to Omaruru (21.14S, 15.00E), 14.iii.2004, 5 ♂♂ (visiting white flowers of *Heliotropium tuberosum* E. Mey. ex Benth., Boraginaceae); 24 km SW [of] Usakos (22.02S, 15.17E), 22.iii.1997, 1 ♀ (visiting blue/violet flowers of *Blepharis obmitrata* C. B. Cl., Acanthaceae); SW [of] Gibeon, 41 km on [road] 1089 (25.20S, 17.29E), 8.iii.1999, 1 ♂ (visiting yellow flowers of *Tribulus* sp., Zygophyllaceae); 32 km SW [of] Helmeringhausen (26.06S, 16.36E), 15.iii.1997, 1 ♂ (visiting white flowers of *Psilocaulon glareosum* (Berger) Dinter & Schwantes, Aizoaceae: Mesembryanthema) – (all F.W. and S.K. Gess) [all AMGS]; Namib Plain, 15 m[iles] E.[of] Natab [circa 23.36S, 15.05E], 29.iv.1969 (H.D. Brown), holotype ♂, paratype ♂ [AMGS]; Awasib Mains, Diamond Area No. 2 [25.18S 15.39E], 14.v.1969 (H.D. Brown), paratype ♂ [SANC].

Geographical distribution. At the time of description the provenance of the limited material was from the south-western Namib, suggesting that it might be limited to that region. The records now available indicate a much more extensive distribution in the desertic to semi-desertic western parts of Namibia (Fig. 14a).

Floral associations. Recorded from six plant families: Acanthaceae (*Blepharis obmitrata* C. B. Cl.); Aizoaceae (Mesembryanthema, *Psilocaulon glareosum* (Berger) Dinter & Schwantes); Amaranthaceae (*Hermbstaedtia* sp.); Asteraceae (*Hirpicium gazanioides* (Harv.) Roessler); Boraginaceae (*Heliotropium tuberosum* E. Mey. ex Benth.); Zygophyllaceae (*Tribulus pterophorus* Persl.).

Nesting. Unknown.

Prey. Unknown.

Bembix ochracea Handlirsch

http://species-id.net/wiki/Bembix_ochracea

Fig. 13b

Bembex ochracea Handlirsch, 1893: 864, pl. 3, fig. 10, ♂ (Holotype, ♂, South Africa, former Transvaal, no locality, in MHNG); Dalla Torre 1897: 509 (in catalogue of world Hymenoptera); Bingham 1902: 211 (South Africa); Arnold 1929: 386, figs 33, 33a–c, pl. 6, fig. 25, ♂, ♀ (in revision of southern African Sphecidae); Arnold 1930: 21 (in checklist of Afrotropical Sphecidae).

Bembix ochracea Handlirsch & Parker, 1929: 118, pl. 11, figs 146–148, ♂ (in revision of Stizini and Bembicini); R. Bohart and Menke 1976: 546 (in checklist of world Sphecidae); Gess and Gess 2003: 124 (flower visiting records); Pulawski 2013: 53 (in catalogue of world Sphecidae sensu lato).

Bembex opima Turner, 1917a: 440, ♂, ♀ (Syntypes, South Africa, Eastern Cape, Willowmore, in BMNH); Arnold 1929, synonymised with *B. ochracea* (in revision of southern African Sphecidae); R. Bohart and Menke 1976: 548 (in checklist of world Sphecidae).

Note. *Bembix ochracea* Handlirsch was described from a single damaged specimen “aus Transvaal”. Parker referred to a specimen from “Cap”, while Arnold recorded it from Willowmore. *Bembix opima* Turner, sunk into synonymy by Arnold, was described from Willowmore (January and February, Dr. H. Brauns).

Material examined. NAMIBIA: Otjinungwa (SE 1712 Ab) [= 17.17S, 12.26E], 17–22.xi.1970 (collector ?), 2 ♀♀ [NMNW]; Marienfluss, 4–8 km S [of] Otjinungwa (SE 1712 Ac) [17.20S, 12.25E], 21–22.xi.1970 (collector ?), 1 ♀, 1 ♂ [NMNW]; near Two Palms, Uniab River (19.53S, 13.54E), 28.iii.2004 (F.W. and S.K. Gess), 1 ♂ (visiting white flowers of *Heliotropium* sp. not *tubulosum*, Boraginaceae) [AMGS]; circa 17 km W [of] Khorixas (20.28S, 14.51E), 16.iii.2004 (F.W. and S.K. Gess), 3 ♂♂ (2 ♂♂ visiting pink flowers of *Hermbsaedia* sp., Amaranthaceae, 1 ♂ visiting yellow flowers of *Geigeria* sp., Asteraceae) [AMGS]; Uis to Khorixas (20.54S, 15.05E), 15.iii.2004 (F.W. and S.K. Gess), 1 ♀ [AMGS]; Uis to Omaruru (21.14S, 15.00E), 14.iii.2004 (F.W. and S.K. Gess), 7 ♀♀ [AMGS]; Uis to Henties Bay (21.26S, 14.45E), 18.iv.2002, (F.W. and S.K. Gess), 2 ♀♀ [AMGS]; Uis/Henties Bay (21.27S, 14.45E), 17.iv.2002 (F.W. and S.K. Gess), 5 ♀♀ (1 ♀ visiting violet flowers of *Monechma genistifolium* (Engl.) C.B. Clarke, Acanthaceae) [AMGS]; 81 km on road from coast to Uis Mine (21.32S, 14.43E), 17.iii.2000 (F.W. and S.K. Gess), 1 ♂ [AMGS]; NW of Cape Cross (21.44S, 13.59E), 14.iii.1999 (F.W. and S.K. Gess), 1 ♀, 2 ♂♂ visiting white flowers of *Brownanthus kuntzei* (Schinz) Ihlenf. & Bittrich, Aizoaceae: Mesembryanthema) [AMGS]; 110 km NW of Swakopmund (21.50S, 14.05E), 15.iii.1999 (F.W. and S.K. Gess), 1 ♀ (visiting yellow flowers of *Galenia papulosa* (Eckl. & Zeyh.) Sond., Aizoaceae: non-Mesembryanthema) [AMGS]; Henties Bay to Usakos via Spitzkoppen (21.54S, 14.58E), 19.iv.2002 (F.W. and S. K. Gess), 1 ♀ [AMGS]; 15 km W of Karibib on road to Usakos (21.56S, 15.42E), 5. iv.1998 (F.W. and S.K. Gess), 8 ♀♀, 1 ♂♂ (1 ♀ visiting deep pink flowers of *Hermbsaedia* sp., Acanthaceae; 1 ♂ visiting violet flowers of *Monechma genistifolium* (Engl.) C.B. Cl., Acanthaceae) [AMGS]; 10 km W of Usakos, Swakopmund road (21.59S, 15.30E), 13.iii.2004 (F.W. and S.K. Gess), 1 ♀ [AMGS]; Okahandja [21.59S, 16.55E], 27.xii.1977 (Empey), 1 ♀ [AMGS]; Swakopmund 117 km on road to Usakos (22.02S, 15.17E), 16.iii.2000 (F.W. and S.K. Gess), 2 ♀♀ [AMGS]; 37 km from Usakos [on road] to Swakopmund (22.03S, 15.16E), 1.iv.2004 (F. W. and S.K. Gess), 2 ♀♀ (1 ♀ visiting yellow flowers of Asteraceae) [AMGS]; Swakopmund 33 km on road to Usakos (22.34S, 14.49E), 15.iii.2000 (F.W. and S.K. Gess), 1 ♀ (visiting cream flowers of *Gomphocarpus filiformis* (E. Mey.) D. Dietr., Asclepiadaceae) [AMGS]; Swakopmund/Usakos near Rössing Mine (22.34S, 14.49E), 5 ♀♀ (F.W. and S.K. Gess) [AMGS]; Swakop River bed on road to Goanikontes (22.41S, 14.35E), 11.iv.1998 (F.W. and S.K. Gess), 1 ♂ (visiting white flowers of *Psilocaulon salicornioides* (Pax) Schwantes, Aizoaceae: Mesembryanthema) [AMGS]; Plains south of Goanikontes (22.42S, 14.47E), 16.iv.2002 (F.W. and S.K. Gess), 17 ♀♀ [AMGS]; Kuiseb River bed at Rooibank (23.11S, 14.39E), 10.iv.1998 (F.W. and S.K. Gess), 6 ♀♀, 1 ♂ (3 ♀♀ visiting yellow flowers of bushy *Geigeria* sp., Asteraceae) [AMGS]; Rooibank [23.11S, 14.39E], 19.xii.1978 (Empey), 5 ♀♀ [AMGS]; between Kuiseb and Gaub passes (23.24S, 15.50E), 23.iii.1999 (F.W. and S.K. Gess), 1 ♀ [AMGS]; Gaub River bed in Gaub Pass (23.29S, 15.46E), 14.iv.1998 (F.W. and S.K. Gess), 2 ♀♀,

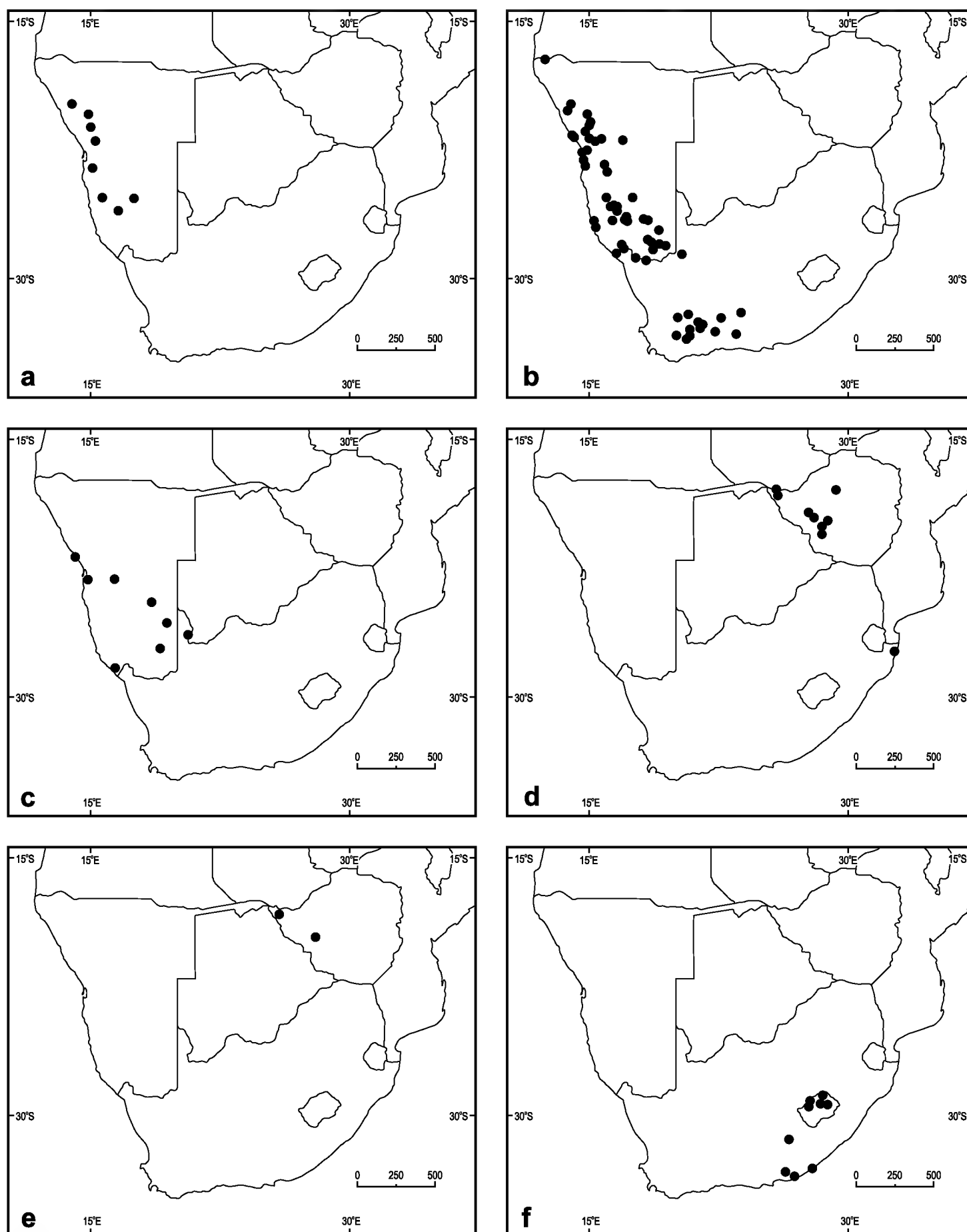


Figure 14. Distributions of collection records of *Bembix* spp.: **a** *namibensis* **b** *ochracea* **c** *olivata* **d** *regnata* **e** *scaura* **f** *sibilans*.

2 ♂♂ (visiting yellow flowers of *Zygophyllum simplex* L., Zygophyllaceae) [AMGS]; Solitaire (23.52S, 16.00E), 30.iv.2002 (F.W. and S.K. Gess), 2 ♀♀ [AMGS]; W [of] Solitaire (23.53S, 16.00E), 6.iv.2002 (F.W. and S.K. Gess), 1 ♀ [AMGS]; Gorrasis 99, Lüderitz (SE 2515 Bd) [25.18S, 15.56E], 12–15.ii.1973 (collector ?), 1 ♀ [NMNW]; SW of

Gibeon, 41 km on [road] 1089 (25.20S, 17.29E), 10.iii.1999 (F.W. and S.K. Gess), 1 ♀ [AMGS]; Sinclair Mine 2, Lüderitz (SE 2516 Cb) [25.43S, 16.23E], 7.x.1972 (collector ?), 1 ♀, 3 ♂♂ [NMNW]; Kanaän 104, Lüderitz (SE 2516 Cc) [25.51S, 16.10E], 6–7.x.1972 (collector ?), 1 ♀, 1 ♂ [NMNW]; Barby 26, Bethanie (SE 2516 Dc) [25.51S, 16.33E], 2–7.x.1972 (collector ?), 10 ♀♀, 1 ♂ [NMNW]; 34 km on [road] C13 from Helmeringhausen (26.05S, 16.38E), 9.iii.1999 (F.W. and S.K. Gess), 2 ♀♀, 1 ♂ (visiting yellow flowers of *Deverra denudata* (Viv.) Pfisterer & Podl., Apiaceae) [AMGS]; 32 km SW of Helmeringhausen (26.06S, 16.36E), 16.iii.1997 (F.W. and S.K. Gess), 3 ♀♀ (1 ♀ visiting yellow flowers of *Deverra denudata* (Viv.) Pfisterer & Podl., Apiaceae) [AMGS]; 12 km E [of] Springbokwater (20.15S, 13.44E), 11.iv.2002 (F.W. and S.K. Gess), 1 ♀ (visiting *Zygophyllum simplex* L., Zygophyllaceae) [AMGS]; Konkiep R[iver] at Bethanie (SE 2717Bd) [26.29S, 17.08E], 23.x.1971 (collector ?), 6 ♂♂ [NMNW]; Keetmanshoop [26.35S, 18.08E], 15.xii.1974 (Empey), 13 ♀♀, 6 ♂♂ [AMGS]; same locality and collector, 29.xii.1977, 7 ♀♀, 9 ♂♂, 19.xi.1984 (F.J. Herbst), 1 ♀ [AMGS]; 17 km E of Keetmanshoop [circa 26.36S, 18.19E], 25.v.1973 (M.F. Johannsmeier), 1 ♀ [AMGS]; near Aus on road to Helmeringhausen (26.37S, 16.20E), 15.iii.1997 (F.W. and S.K. Gess), 3 ♀♀, 3 ♂♂ (visiting white flowers of *Psilocaulon glareosum* (Berger) Dinter & Schwantes, Aizoaceae: Mesembryanthema) [AMGS]; Riverside 135, Bethanie (SE 2616 Ca) [26.37S, 17.00E], 23–16 (*sic*). x.1971 (collector ?), 1 ♀ [NMNW]; Klein-Aus Vista (26.39S, 16.15E), 2.iii.2000 (F.W. and S.K. Gess), 5 ♀♀, 1 ♂ [AMGS]; Aus [26.40S, 16.15E], . xii.1929 (R.E. Turner), 2 ♀♀ [SAMC ex NMBZ]; Aus (26.40S, 16.15E), 2.iii.2000, 1 ♂; same locality, 3.iii.2000 (F.W. and S.K. Gess), 2 ♂♂ (visiting yellow flowers of *Acacia* sp., Mimosaceae) [AMGS]; Keetmanshoop/Aus, 96 km E of Aus (26.42S, 17.11E), 28.iii.2000 (F.W. and S.K. Gess), 1 ♀ (visiting yellow flowers of *Tribulus* sp., Zygophyllaceae) [AMGS]; Sperrgebiet, Dreizakberg (27.01S, 15.23E), 8.ix.2005 (F.W. and S.K. Gess), 1 ♀ (hunting at bushes) [AMGS]; Noachabeb 97, Keetmanshoop (SE 2718 Ad), 7–12.i.1972 (collector ?), 1 ♀ [NMNW]; Karas Mountains, 14 km south on [road] 201 from [road] 26 (27.12S, 18.59E), 7.iii.1999 (F.W. and S.K. Gess), 1 ♂ (visiting yellow flowers of *Geigeria pectidea* (DC.) Harv., Asteraceae) [AMGS]; G[rea]t Karas Mountains, xi.1936 (Mus. Staff), 13 ♀♀, 7 ♂♂ [SAMC]; Grünau [27.44S, 18.23E], 19.xi.1984 (F.J. Herbst), 2 ♀♀, 2 ♂♂ [AMGS]; W of Karasburg on road to Grünau (27.54S, 18.41E), 13.iii.1997 (F.W. and S.K. Gess), 3 ♀♀, 2 ♂♂ (on cream flowers of *Gomphocarpus filiformis* (E. Mey.) D. Dietr., Asclepiadaceae) [AMGS]; Karasburg (28.00S, 18.45E), 13.iii.1997 (F.W. and S.K. Gess), 2 ♂♂ (1 ♂ on cream flowers of *Gomphocarpus filiformis* (E. Mey.) D. Dietr., Asclepiadaceae; 1 ♂ on yellow flowers of *Acacia karroo* Hayne, Mimosaceae) [AMGS]; Karasburg, 14.xii.1974 (Empey), 4 ♀♀ [AMGS]; same locality and collector, 5.i.1975, 4 ♀♀, 9.i.1975, 1 ♀, 10.xii.1983, 2 ♀♀, 2 ♂♂ [AMGS]; 30 km E of Karasburg on road from Ariamsvlei (28.00S, 19.03E), 12.iii.1997 (F.W. and S.K. Gess), 13 ♀♀, 1 ♂♂ (visiting yellow flowers of *Geigeria* sp., Asteraceae) [AMGS]; 10 km NE [of] Rosh Pinah [?], 16.x.1972 (H.D. Brown, E. Koster, A. Prinsloo), 1 ♀ [AMGS]; 16 km S [of] Rosh Pinah (28.04S, 16.51E), 13.x.2000 (F.W. and S.K. Gess), 3 ♀♀, 2 ♂♂ (1 ♀ visiting white flowers of Aizoaceae: Mesembryanthema) [AMGS]; between Karasburg and Ariamsvlei (28.05S, 19.25E), 18.iv.1998 (F.W. and S.K. Gess), 2 ♀♀ (visiting yellow flowers of

Geigeria pectidea (DC.) Harv., Asteraceae) [AMGS]; Ortman'sbaum 120, Warmbad (SE 2818 Bd) [28.21S, 18.41E], 18–21.x.1971 (collector ?), 1 ♂ [NMNW]; Gt. Fish R[iver], Aiais [Ais-Ais], S.W.A., xi.1936 (Mus. Staff), 1 ♀ [NMNW]. SOUTH AFRICA: NORTHERN CAPE: Richtersveld (2816BB) [circa 28.16S, 16.55E] at rd. Khubus-Ochta near Vyfsusters Mt., 7.x.1987 (M. Struck), 1 ♀, 1 ♂ [AMGS]; Pachtvlei, E [of] Alexander Bay (28.33S, 16.34E), 10.x.2000 (F.W. and S.K. Gess), 1 ♀ [AMGS]; 23 km N of Kakamas on road to Lutzputz [28.34S, 20.34E], 13.iii.1990 (F.W. and S.K. Gess), 1 ♀ [AMGS]; Augrabies Nat. Reserve [28.35S, 20.20E], 11.xii.1974 (Empey), 1 ♀ [AMGS]; Vioolsdrift, Namaqualand [28.46S, 17.38E], iii.1935 (Museum Staff), 3 ♂♂ [SAMC]; Goodhouse [28.55S, 18.13E], xi.1936 (Mus. Staff), 4 ♀♀, 3 ♂♂ [SAMC]. WESTERN CAPE: Prince Albert Dist., Tierberg (Study Site) (33.10S, 22.16E), 26.xi.-5.xii.1987 (F.W., S.K. and R.W. Gess), 19 ♀♀, 11 ♂♂ (9 ♀♀, 11 ♂♂, on flowers of *Gomphocarpus filiformis* (E. Mey.) D. Dietr., Asclepiadaceae; 2 ♀♀ on flowers of *Carissa haematocarpa* (Eckl.) DC, Apocynaceae); Prince Albert Dist., Tierberg [Study Site] (33.10S, 22.16E), 16.xi.1994 (F.W. and S.K. Gess), 4 ♀♀, 1 ♂ (on cream flowers of *Gomphocarpus filiformis* (E. Mey.) D. Dietr., Asclepiadaceae); Prince Albert Dist., Tierberg (Res[earch Stat[ion]]) (33.08S, 22.16E), 26.xi.-5.xii.1987 (F.W., S.K. and R.W. Gess), 7 ♀♀, (2 ♀♀ on flowers of *Acacia karroo* Hayne, Fabaceae, Mimosoideae); Prince Albert Dist., Tierberg Farm (33.10S, 22.15E), 21.i.1996 (F.W. and S.K. Gess), 1 ♂ (visiting cream flowers of *Gomphocarpus filiformis* (E. Mey.) D. Dietr., Asclepiadaceae) [AMGS]; Touwsrivier [33.20S, 20.02E], 9.i.1975 (Empey), 1 ♂ [AMGS]; Bushmans Riv[er], Letjiesbosch, Koup [32.34S, 22.16E], xi.1935 (Mus. Staff), 1 ♂ [SAMC]; Letjiesbosch, Koup, iii.1937 (Mus. Staff), 3 ♀♀ [SAMC]; Merweville Distr[ict] [32.40S, 21.31E], ii.1941 (H. Zinn), 2 ♀♀ [SAMC]; Merweville Distr[ict], i-ii.1947 (H. Zinn), 117 ♀♀, 22 ♂♂ [SAMC]; Merweville Distr[ict], 8.ii.1978 (H. Zinn), 2 ♀♀ [SAMC]; Merweville, Laingsburg Distr[ict] [32.40S, 21.31E], i.1959 (H. Zinn), 21 ♀♀, 5 ♂♂ [SAMC]; Dikbome, Merweville, Koup [32.54S, 21.22E], i.1953 (H. Zinn), 41 ♀♀, 77 ♂♂ [SAMC]; Rooinek, Laingsburg Distr[ict] [33.20S, 20.52E], i.1949 (Zinn-Hesse Mus. Exp.), 1 ♂ [SAMC]; Spitzkop, Laingsburg Disr[ict] [33.30S, 20.35E], iii.1938 (Mus. Staff), 1 ♀, 1 ♂ [SAMC]; Thee Kloof [32.05S, 20.41E], Fraserburg Div[ision], xi.1935 (Mus. Staff), 1 ♀, 1 ♂ [SAMC]; Moordenaars Karoo, Laingsburg Div[ision] [circa 32.58S, 20.49E], iii.1937 (Mus. Staff), 1 ♀, 1 ♂ [SAMC]; Moordenaars Karoo, Laingsburg Div[ision], xi.1937 (Mus. Staff), 5 ♀♀, 1 ♂ [SAMC]; Beaufort West Distr[ict] [circa 32.18S, 22.36E], ii.1958 (S.A.M.), 9 ♀♀, 9 ♂♂ [SAMC]; Beaufort West, Oukloof [circa 32.18S, 22.36E], i.1949 (Zinn-Hesse Mus. Exp.), 2 ♀♀, 1 ♂ [SAMC]; Murraysburg Distr[ict] [circa 31.58S, 23.47E], iii.1931 (Museum Staff), 3 ♀♀, 6 ♂♂ [SAMC]; Tankwa Karoo, Renoster Riv[er] [circa 32.16S, 20.05E], xi.1952 (Mus. Expd.), 1 ♂ [SAMC]; Gouph, Laingsburg Distr[ict] [circa 33.12S, 20.52E], ix.1937 (Museum Staff), 1 ♀, 3 ♂♂ [SAMC]; Vogelfontein, Prince Albert Div[ision], iii-iv.1929 (A. J. Hesse), 4 ♀♀ [3 ♀♀ SAMC; 1 ♀ SAMC ex NMBZ]; Matjiesfontein, 14–27.xi.1928 (R.E. Turner), 1 ♂ [SAMC ex NMBZ]. EASTERN CAPE: Willowmore [33.15S, 23.30E], 5.iii.1902 (Brauns), 1 ♀ [SAMC ex NMBZ]; same locality and collector, 25.xii.1902 (Brauns), 1 ♀ [AMGS], 15.iii.1919 (Brauns), 1 ♂ [SAMC ex NMBZ], 20.i.1922, 1 ♀ [AMGS], no date, 1 ♂ [AMGS].

Geographical distribution. Principally in western semi-arid to arid Namibia extending to the coast and southwards and eastwards through northern Namaqualand across the western and southeastern Nama-Karoo (Fig. 14b).

Floral associations. Recorded from nine plant families: Boraginaceae (*Heliotropium* sp. not *tubulosum*); Acanthaceae (*Monechma genistifolium* (Engl.) C.B. Clarke); Amaranthaceae (*Hermestaedtia* sp.); Asteraceae (*Geigeria pectidea* (DC.) Harv. and *Geigeria* sp. (Asteraceae)); Aizoaceae (Mesembryanthema, *Brownanthus kuntzei* (Schinz) Ihlenf. & Bittrich, *Psilocaulon salicornioides* (Pax) Schwantes (Aizoaceae: Mesembryanthema) and *Psilocaulon glareosum* (Berger) Dinter & Schwantes; non-Mesembryanthema, *Galenia papulosa* (Eckl. & Zeyh.) Sond.); Zygophyllaceae (*Tribulus* sp. and *Zygophyllum simplex* L.); Apiaceae (*Deverra denudata* (Viv.) Pfisterer & Podl.); Fabaceae (Mimosoideae, *Acacia* sp.); Apocynaceae (*Carissa haematocarpa* (Eckl.) DC; formerly Asclepiadaceae, *Gomphocarpus filiformis* (E. Mey.) D. Dietr.).

Nesting. Unknown.

Prey. Unknown.

***Bembix olivata* Dahlbom**

http://species-id.net/wiki/Bembix_olivata

Fig. 13c

Bembex olivata Dahlbom, 1845: 491, ♀ (Holotype or syntype, ♀, South Africa, Cape of Good Hope, in Lund or Stockholm); Handlirsch 1893: 812, pl. 2, fig. 17, pl. 5, fig. 23, ♂, ♀ (in revision of world Bembicini); Dalla Torre 1897: 510 (in catalogue of world Hymenoptera); Magretti 1899: 51 (Somalia); Bingham 1902: 211 (Malawi); Cameron 1910: 144 (Olifants River [Mpumalanga] South Africa); Schouteden 1930: 96 (Zaire).

Bembex olivata Dahlbom, R. Bohart and Menke 1976: 548 (in checklist of world Sphecidae); Pulawski 2013: 63 (in catalogue of world Sphecidae sensu lato).

Bembex intermedia Dahlbom, 1845: 491, ♀ (Holotype or syntypes, ♀, South Africa, Port Natal (now Durban), in Lund or Stockholm); Handlirsch 1893: 812 (tentatively synonymised with *Bembex olivata*, in revision of world Bembicini); Arnold 1929: 358, figs 23, 23a, 23b, pl. 6, fig. 19, ♂, ♀ (in revision of southern African Sphecidae as valid name for *Bembex olivata*); Arnold 1930: 21 (in checklist of Afrotropical Sphecidae); Arnold 1935: 503 (Metsimaklaba, Kalahari, 12.iii.1930, Vernay-Lang Expedition, 3 ♂♂, 6 ♀♀).

Bembex intermedia Dahlbom & Arnold, 1951: 138 (Ethiopia, Danakil, Mille River, vii.1946, K.M. Guichard, ♀); Gess and Gess 2003: 124 (flower visiting records).

Material examined. NAMIBIA.Swakopmund (21.51 S14.05E), 12.iv.1998 (F.W. Gess and S.K. Gess) 1 ♀ (visiting yellow flowers of *Senecio* sp. Asteraceae) [AMGS]; Swakopmund, 12.iv.1998 (F.W. Gess and S.K. Gess) 1 ♀ 2 ♂♂ (visiting yellow flowers of *Zygophyllum simplex* L., Zygophyllaceae) [AMGS]; Rooibank, Kuiseb R. (23.11S,

14.49E), 10.iv.1998, (F.W. Gess and S.K. Gess) 3 ♂♂ (visiting yellow flowers of *Geigeria pectidea* (DC.) Harv.), Asteraceae) [AMGS]; Rooibank, Kuiseb R., 10.iv.1998, (F.W. Gess and S.K. Gess) 3 ♂♂ (visiting yellow flowers of *Zygophyllum simplex* L., Zygophyllaceae) [AMGS]; Hakos/Weissenfels (28.18S, 16.23E), 21.iii.2000 (F.W. Gess and S.K. Gess) 1 ♀, 1 ♂ (visiting white flowers of *Selago dinteri* Rolfe, Scrophulariaceae) [AMGS]; Rehoboth (23.10S, 16.42E), 11.iii.1999, (F.W. Gess and S.K. Gess) 4 ♂♂ (visiting pink flowers of *Hermbsstaedtia odorata* (Burch.) T. Cooke, Amaranthaceae) [AMGS]; Aranos/Stampriet (24.30S, 18.32E), 27.iii.2000 (F.W. Gess and S.K. Gess) 9 ♂♂ (visiting pink flowers of *Hermbsstaedtia odorata* (Burch.) T. Cooke, Amaranthaceae) [AMGS]; Koes/Gochas (25.40S, 19.24E), 7.iii.2000 (F.W. Gess and S.K. Gess) 1 ♀ (visiting yellow flowers of *Tribulus* sp., Zygophyllaceae) [AMGS]; Gross Nabas (24.30S, 18.32E), 30.iii.2000 (F.W. and S. K. Gess) 1 ♀ (visiting white flowers of *Limeum argute-carinatum* Wawra & Peyr., Molluginaceae) [AMGS]; Karasberge (27.09S, 19.01E) 5.iii.2000 (F.W. and S.K. Gess), 1 ♀ (visiting white flowers of *Limeum argute-carinatum* Wawra & Peyr., Molluginaceae) [AMGS]. NORTHERN CAPE: Twee Rivieren (26.24S, 20.40E), 8–11.iii.1990 (F.W. Gess and S.K. Gess) 27 ♀♀, 27 ♂♂ (visiting yellow flowers of *Deverra denudata* (Viv.) Pfisterer & Podl., Apiaceae) [AMGS].

Additional records extracted from database of specimens in collection of SAMC were determined by G. Arnold and H. Brauns, from Namibia and from KwaZulu-Natal, Mfongosi [28.43S, 30.48E].

Geographical distribution. In southern Africa recorded from the northwestern Namibian coast at Swakopmund south eastwards through Namibia to the southern Kalahari and also from KwaZulu-Natal (Fig. 14c). Also recorded from Ethiopia and Somalia in the northeast and Zaire in the northwest. The overall distribution is therefore unclear and further records are required to establish a distribution pattern.

Floral associations. Recorded from six plant families: Molluginaceae (*Limeum argute-carinatum* Wawra & Peyr); Amaranthaceae (*Hermbsstaedtia odorata* (Burch.) T. Cooke); Apiaceae (*Deverra denudata* (Viv.) Pfisterer & Podl.); Asteraceae (*Geigeria pectidea* (DC.) Harv.) and *Senecio* sp.); Scrophulariaceae (*Selago dinteri* Rolfe); Zygophyllaceae (*Tribulus* sp. and *Zygophyllum simplex* L.).

Nesting. Unknown.

Prey. Unknown.

***Bembix regnata* J. Parker**

http://species-id.net/wiki/Bembix_regnata

Fig. 13d

Bembix regnata Parker, 1929 (June): 111, pl. 13, figs 179–183, ♂, ♀ (Holotype, ♂, Tanganyika [Tanzania] in ZMNH); Arnold 1931: 209, 216; Benson 1934 (prey Lepidoptera); Gess 1986: 158 (prey listed); R. Bohart and Menke 1976: 548 (in checklist of world Sphecidae); Evans 2002a: 5 (known to prey on Lepidoptera) Pulawski 2013: 70 (in catalogue of world Sphecidae sensu lato).

Bembix speciosa Arnold, 1929 (December): 337, figs 8, 8a-e, ♂, ♀ (Syntypes, ♂, Southern Rhodesia [Zimbabwe], Gwaai, in SAMC ex NMBZ) (in revision of southern African Sphecidae); Arnold 1931: 209, 216 (synonymised with *regnata*); R. Bohart and Menke 1976: 548 (in checklist of world Sphecidae).

Note. *Bembix regnata* was described by Parker from two localities in Tanganyika (Usaramo and Rufiaji Klurtusteppe) and Nyasa [Malawi] (Lake Nyasa). Arnold described his *speciosa* from Southern Rhodesia [Zimbabwe] (Gwaai, Victoria Falls, Matopos, Sanyati Valley and Bulawayo).

Material examined. ZIMBABWE: Gwaai [= Gwai] [19.17S, 27.43E], 16.i.1927 (G. Arnold), 1 ♀, 1 ♂ Types of *B. speciosa* Arnold [SAMC ex NMBZ]; Matopos [20.35S, 28.30E], 18.xi.1923 (Rhodesia Museum), 1 ♂ [SAMC ex NMBZ]; Sanyati Valley [17.58S, 29.17E], ix-x.1925 (R.H. R. Stevenson), 1 ♂ [SAMC ex NMBZ]; Turk Mine [19.44S, 28.48E], 16.xii.1957 (Nat. Museum S. Rhodesia), 1 ♂ [SAMC ex NMBZ]; Sawmills [19.35S, 28.02E], 4.ii.1926 (R.H.R. Stevenson), 1 ♂ [SAMC ex NMBZ]; Wangezi Riv. [?], i.1928 (R.H.R. Stevenson), 1 ♂ [SAMC ex NMBZ]; W. Matetsi [18.15S, 25.55E], iv.1934 (R.H.R. Stevenson), 3 ♀♀, 1 ♂ [SAMC ex NMBZ]; Bulawayo [20.07S, 28.32E], 24.xii.1924 (R.H.R. Stevenson), 1 ♀ SAMC ex NMBZ; Bulawayo [20.07S, 28.32E], 16.i.1938 (Nat. Museum S. Rhodesia), 1 ♀ [SAMC ex NMBZ]; Victoria Falls [17.55S, 25.50E], 1934 (Nat. Museum S. Rhodesia), 1 ♀ [SAMC ex NMBZ]; Westwood, Vic. Falls, [circa 17.56S, 25.50E] 26. iii.1934 (R.H.R.S.), 1 ♀ [SAMC ex NMBZ]; Westwood nr Matetsi [18.17S, 25.5E], 30.iii.1934 30.iii.1934 (R.H.R. Stevenson), [SAMC ex NMBZ]; SOUTH AFRICA: KWAZULU-NATAL: Lake Sibaya [27.23S, 32.41E], 13–25.iii.1968 (D.J. Brothers), 1 ♂ [AMGS].

Additional records extracted from database of specimens in collection of SAMC are six specimens from Zimbabwe and one specimen from Nyaka (no country given), no sexes or determiners given.

Geographical distribution. From north to south Zimbabwe, in South Africa known from one specimen from northern coastal KwaZulu-Natal (Fig. 14d). Further records are required to establish a distribution pattern.

Floral associations. Unknown.

Nesting. Unknown.

Prey. Recorded taking three families of Lepidoptera: Pieridae, Hesperidae, and Nymphalidae (Benson 1934).

Bembix scaura Arnold

http://species-id.net/wiki/Bembix_scaura

Fig. 13e

Bembex scaura Arnold, 1929: 340, figs 10. 10a-e, pl. 6, fig. 51, ♂, ♀ (Syntypes, ♂, S. Rhodesia [Zimbabwe], Sawmills and ♀, Sawmills, S. Rhod. [Zimbabwe], in SAMC ex NMBZ) (in revision of southern African Sphecidae).

Bembix scaura Arnold, R. Bohart and Menke 1976: 548 (listed in checklist of world Sphecidae); Pulawski 2013: 79 (in catalogue of world Sphecidae sensu lato).

Material examined. ZIMBABWE: Sawmills [19.35S, 28.02E], S. Rhodesia, 1.iv.1923 (G. Arnold), Holotype ♂; Sawmills, S. Rhod, 1st April, 1923 (Roy Stevenson), Allotype ♀; W. Matetsi, iv. 1934 (R.H.R. Stevenson) 1 ♀; Westwood, nr. Matetsi [18.15S, 25.55E], 30.iii.1930 (R.H.R. Stevenson) 1 ♂ [all SAMC ex NMBZ].

Geographical distribution. Known only from Zimbabwe (Fig. 14e).

Floral associations. Unknown.

Nesting. Unknown.

Prey. Unknown.

Bembix sibilans Handlirsch

http://species-id.net/wiki/Bembix_sibilans

Fig. 13f

Bembex sibilans Handlirsch, 1893: 852, pl. 3, fig. 3. Pl. 7, fig. 30, ♂, ♀ (Syntypes, South Africa, Cape Province, no locality, in NMW, ZMHB, TMB, RMCA); Dalla Torre 1897: 514 (in catalogue of world Hymenoptera); Bingham 1902: 211 (South Africa, Malawi); Arnold 1929: 374, figs 37, 37a, 37b, pl. 6, fig. 31, ♂, ♀ (in revision of southern African Sphecidae); Arnold 1930: 21 (in checklist of Afro-tropical Sphecidae).

Bembix sibilans Handlirsch & Lohrmann, 1948: 448 (member of *fuscipennis* species group); de Beaumont 1967: 506 (South Africa, Cape Province); R. Bohart and Menke 1976: 548 (in checklist of world Sphecidae); Gess 1981: 21 (habitat); Gess 1986: 154–155, 158 (plants visited, nesting, prey); S. Gess 1996: 275, 291, 304 (flower visiting records); Gess and Gess 2003: 125 (flower visiting records); Evans and O’Neil 2007: 185 (summary of information on nesting habits); Pulawski 2013: 80 (in catalogue of world Sphecidae sensu lato).

Material examined. LESOTHO: Bokong P.O. [29.17S, 28.23E], 26.xii.1946 (L. Bevis), 1 ♂ [AMGS]; Leribe [28.52S, 28.3E], 22.xii.1933 (C. Guillaumod), 1 ♀ [AMGS]; Malinguaneng [29.19S, 28.47E], 15.i.1955 (A. Jacot-Guillaumod), 1 ♀ [AMGS]; Mamathes [29.08S, 27.51E], ii.1940 (C. Jacot-Guillaumod), 1 ♂, iv.1940 (C. Jacot-Guillaumod), 1 ♀, xi.1940 (C. and A. Jacot-Guillaumod), 2 ♂♂, xii.1940 (C. and A. Jacot-Guillaumod), 2 ♂♂, xii.1941 (C. and A. Jacot-Guillaumod), 1 ♀, 13.i.1945 (A. Jacot-Guillaumod), 1 ♀, 5.i.1946 (C. Jacot-Guillaumod), 1 ♀, 15.xii.1946 (C. Jacot-Guillaumod), 1 ♂, 14.xi.1948 (C. Jacot-Guillaumod), 1 ♀, 8.xi.1949 (C. Jacot-Guillaumod), 4 ♂♂, 13.xi.1949 (C. Jacot-Guillaumod), 3 ♂♂, 17.xi.1949 (C. Jacot-Guillaumod), 2 ♂♂, 18.xi.1949 (C. Jacot-Guillaumod), 1 ♂, 1. xi.1951 (C. Jacot-Guillaumod), 1 ♂, 2.xi.1951 (C. Jacot-Guillaumod), 1 ♂, 4.xi.1951

(C. Jacot-Guillarmod), 1 ♀, 7.xi.1951 (A. Jacot-Guillarmod), 1 ♂, 18.xi.1951 (C. Jacot-Guillarmod), 2 ♂♂, 23.xi.1952 (C. Jacot-Guillarmod), 1 ♀, 22.xi.1952 (C. Jacot-Guillarmod), 1 ♀, 2.i.1953 (C. Jacot-Guillarmod), 1 ♀, 14.xi.1954 (C. Jacot-Guillarmod), 1 ♀, 22.i.1956 (C. Jacot-Guillarmod), 1 ♀, 1.xii.1957 (C. Jacot-Guillarmod), 1 ♀ [all AMGS]; Roma [29.28S, 27.44E], 17.xii.1964 (C. Jacot-Guillarmod), 3 ♂♂ [AMGS]; Roma, 17.xii.1964 (D.J. Brothers), 1 ♀, 1 ♂ [AMGS]. SOUTH AFRICA: EASTERN CAPE: Bathurst [33.29S, 26.50E], 14.i.1959 (C. Jacot-Guillarmod), 1 ♂ [AMGS], Belmont Valley [33.19S, 26.35E], Grahamstown, 24.i.1970 (C. Jacot-Guillarmod), 1 ♀ (on flowering *Foeniculum vulgare* Mill., Apiaceae) [AMGS]; East London [33.03S, 27.55E], no date given (G. Rattray), 1 ♂ [AMGS]; Gxulu River [33.07S, 22.44E], 15.xii.1970 (F.W. Gess), 1 ♀ [AMGS]; Hilton farm [33.15S, 26.20E], Grahamstown, 1–4.xii.1970 (F.W. Gess), 1 ♂ (Malaise trap). WESTERN CAPE: Grootbos Nature Reserve (34.31S, 19.26E), 20.xi.2012 (S.K. Gess), 1 ♂ (on sandy road, female sighted taking prey into nest) [AMGS].

Additional records extracted from database of specimens in collection of SAMC are eight specimens from Lesotho, Mamathes, two determined by G. Arnold, and a ninth specimen from Port Elizabeth determined by H. Brauns, no sexes given.

Geographical distribution. Known only from Lesotho and the Eastern Cape (Fig. 14f).

Floral associations. Recorded from four plant families: Apiaceae (one female on flowering *Foeniculum vulgare* Mill.); Asteraceae (*Berkheya heterophylla* (Thunb.) O. Hoffm. and *Chrysocoma ciliate* L.); Boraginaceae (*Anchusa capensis* Thunb.); Scrophulariaceae (*Phyllopodium cuneifolium* (L. f.) Benth.).

Nesting. Two nests were investigated, one at Hilton and the other at Slaaikraal, both Eastern Cape. Both were single-celled sloping burrows excavated in friable soil. Unlike the nests of other species of southern African species, in neither nest did the main shaft end in a spur.

Prey. Recorded taking six families of Diptera: Tabanidae, Nemestrinidae, Bombyliidae, Calliphoridae, Sarcophagidae, and Tachinidae.

***Bembix triangulifera* Arnold**

http://species-id.net/wiki/Bembix_triangulifera

Fig. 15a

Bembix stevensoni (non Parker) Arnold, 1929: 331, figs 3, 3a, 3b; Plate VI, fig.48, ♂, (Holotype, ♂, Southern Rhodesia [Zimbabwe], Bulawayo, in SAMC ex NMBZ) (in revision of southern African Sphecidae).

Bembix triangulifera Arnold, 1944: 23, ♀ (substitute name for *stevensoni*); R. Bohart and Menke 1976: 549 (in checklist of world Sphecidae); Pulawski 2013: 88 (in catalogue of world Sphecidae sensu lato).

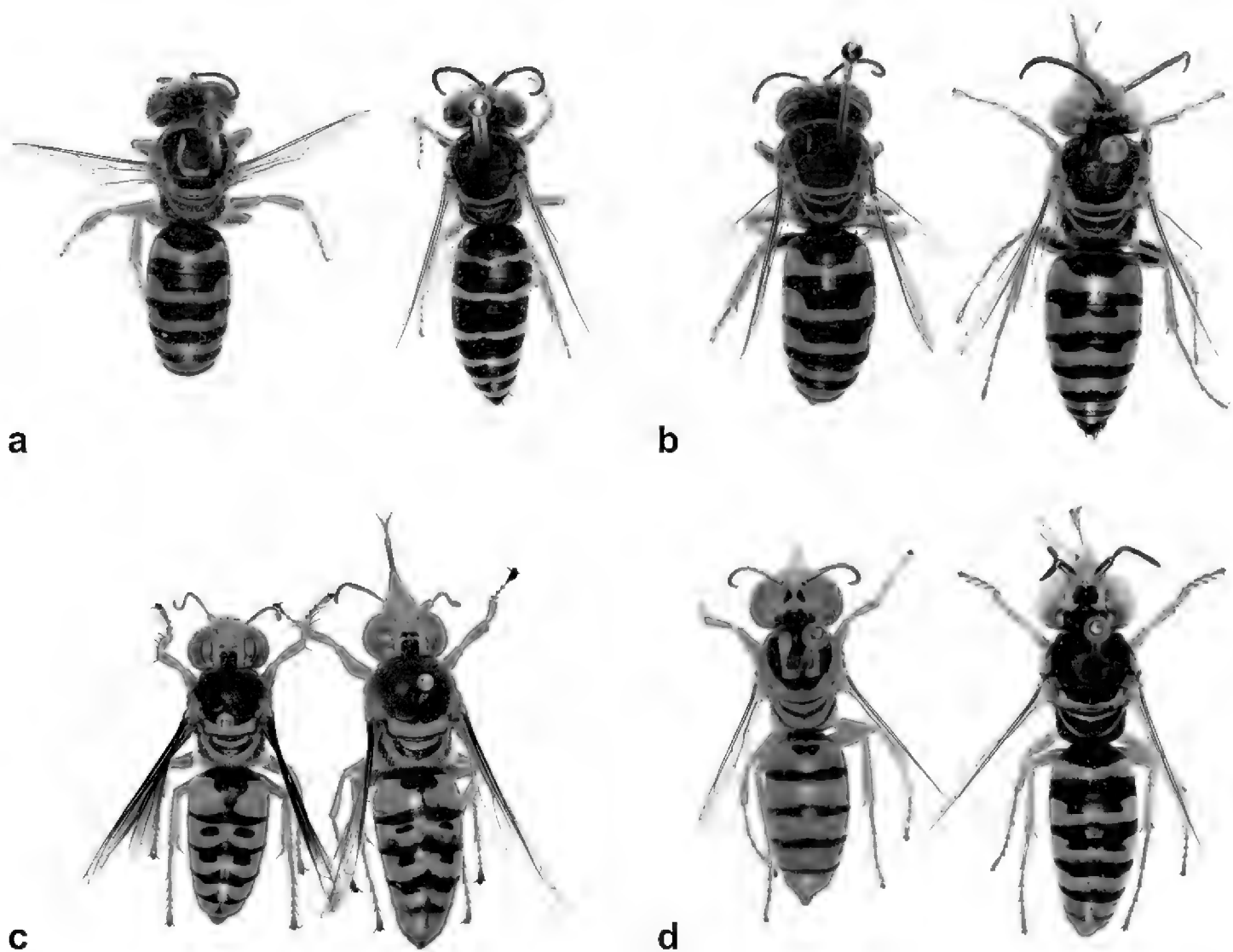


Figure 15. *Bembix* spp.: **a** *triangulifera*, female, male **b** *ulula*, female, male **c** *venusta*, female, male **d** *zinni*, female, male. (approximate lengths of females: **a** 14.5 mm; **b** 15.5 mm; **c** 22 mm; **d** 14 mm).

Note. The specific name, *stevensoni*, proposed by Arnold (December, 1929) is pre-occupied by *stevensoni* Parker (June, 1929) and in consequence Arnold (1944) proposed the substitute name *triangulifera*, at the same time describing the hitherto unknown female. However, both the holotype male and the allotype female are labelled in Arnold's handwriting as *angulifera*, not *triangulifera*.

Material examined. ZIMBABWE: W. Matetsi [18.15S, 25.55E], iv.1934 (R.H.R. Stevenson), 1 ♀; Sawmills [19.35S, 28.02E], 11.iii.1924 (R.H.R. Stevenson), 1 ♂; same locality and collector, 12.iii.1924, 1 ♂; Igusi [19.40S, 28.05E], 9.iii.1941 (Nat. Museum S. Rhodesia), 2 ♂♂; Umgusa Valley [20.02S, 28.34E], 16.ii.1941 (Nat. Museum S. Rhodesia), allotype ♀, 1 ♂; Bulawayo [20.07S, 28.32E], 7.i.1923 (Rhodesia Museum), holotype ♂ [all SAMC ex NMBZ]. SOUTH AFRICA: MPUMALANGA: Newington, Komatipoort [25.25S, 31.55E], 9.i.1912 (J.P. Fenouhlet), 1 ♀; NORTH WEST PROVINCE: Rustenburg [25.41S, 27.14E], 1.viii.1967 (H.N. Empey), 1 ♂. NORTHERN CAPE: Campbell [28.48S, 23.44E], 7.i.1916 (collector ?), 1 ♀ [all AMGS].

Geographical distribution. Known only from Zimbabwe and northern South Africa (Fig. 16a).

Floral associations. Unkown.

Nesting. Unknown.

Prey. Unknown

***Bembix ulula* Arnold**

http://species-id.net/wiki/Bembix_ulula

Fig. 15b

Bembex ulula Arnold, 1929: 330, figs 2, 2a, 2b, Pl.VI, figs 3, 43, ♂, ♀ (flower visiting), (Syntypes, Southern Rhodesia [Zimbabwe], Gwaai, in SAMC ex NMBZ and Zimbabwe, in SAMC) (in revision of southern African Sphecidae); Arnold 1930: 21 (in checklist of Afrotropical Sphecidae); Arnold 1935: 503 (Botswana);

Bembix ulula Arnold, Bohart and Menke 1976: 549 (in checklist of world Sphecidae); Gess 1986 (justification of synonymy with *Bembix junodi*): 147; Pulawski 2013: 90 (in catalogue of world Sphecidae sensu lato).

Bembix Junodi Arnold, 1929: 379, figs 42, 42a, 42b, 42c, Pl. VI, fig 45, ♂ (Holotype, ♂, Mozambique, Lourenço Marques (now Maputo), in TMSA) (in revision of southern African Sphecidae); Gess 1986: 147 (synonymized with *B. ulula*).

Material examined. ZIMBABWE: W. Matetsi [18.15S, 25.55E], iv.1934 (R.H.R. Stevenson), 2 ♀♀ [SAMC ex NMBZ]; Lupane [18.55S, 27.45E], xii.1938 (National Museum S. Rhodesia), 1 ♀ [AMGS], 1 ♂ [SAMC ex NMBZ]; Gwaai [19.17S, 27.43E], 16.i.1927 (G. Arnold), 1 ♂ (holotype), 1 ♀ (allotype), 1 ♀ [SAMC ex NMBZ]; Insuza River [19.25S, 18.05E], 24.xii.1939 (Nat. Museum S. Rhodesia), 1 ♂ [SAMC ex NMBZ]; Sawmills [19.35S, 28.02E], 22–27.xii.1923 (R.H.R. Stevenson), 1 ♀ [AMGS]; same locality, 22.ii.1925 (Rhod. Museum), 1 ♀ [SAMC ex NMBZ]; same locality, 4.ii.1926 (R.H.R. Stevenson, 1 ♀ [SAMC ex NMBZ]. NAMIBIA: circa 17km W [of] Khorixas (20.28S, 14.51E), 16.iii.2004 (F.W. and S. K. Gess), 1 ♂ (visiting pink flowers of *Hermbsaedia* sp., Amaranthaceae) [AMGS]. SOUTH AFRICA: KWAZULU-NATAL: Manguzi River near Maputa, Z[ululand] [circa 26.59S, 32.45E], xi-xii.1945 (H. Bell-Marley), 1 ♂ [AMGS]. NORTHERN CAPE: ??, 24–27.iv.1973 (M.W. Mansell), 1 ♀ (Malaise trap) [AMGS].

Additional records given by Arnold 1929 and 1935: ZIMBABWE: Victoria Falls [17.55S, 25.50E], Springvale [18.22S, 30.22E]. BOTSWANA: Kuke Pan, Kalahari [23.23S, 24.27E].

Geographical distribution. Known from Zimbabwe, Namibia, Botswana, northern KwaZulu-Natal and the Northern Cape (Fig. 16b).

Floral associations. Recorded from two plant families: Amaranthaceae (one record only, a female visiting flowers of *Hermbsaedia* sp.) (Gess and Gess); Fabaceae, Papilionoideae, “small leguminous, clover-like plant (Arnold).

Nesting. Unknown.

Prey. Unkown.

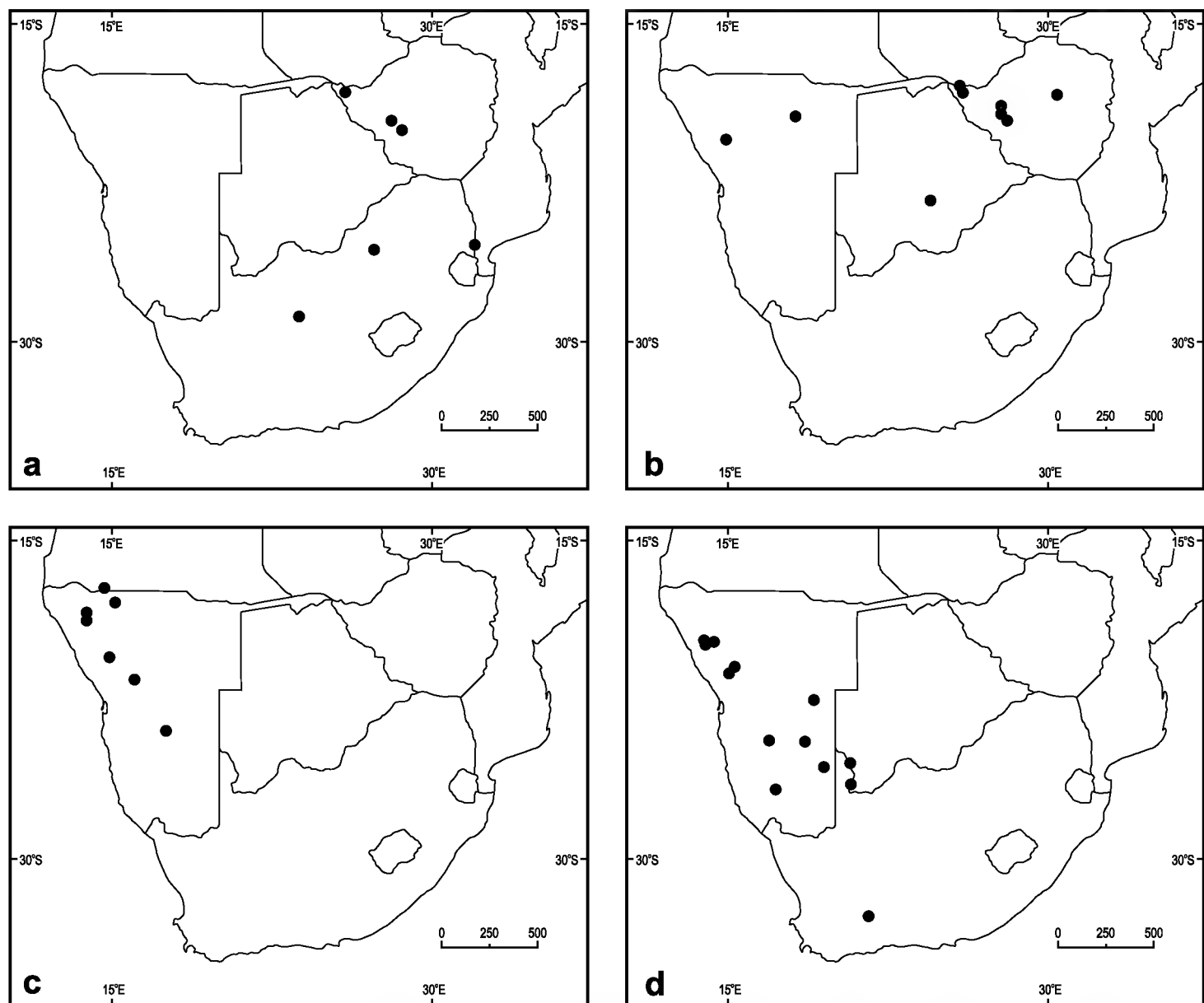


Figure 16. Distributions of collection records of *Bembix* spp.: **a** *triangulifera* **b** *ulula* **c** *venusta* **d** *zinni*.

***Bembix venusta* Arnold**

http://species-id.net/wiki/Bembix_venusta

Fig. 15c

Bembix venusta Arnold, 1929: 347, figs 15, 15a-d, plate VI, figs 35, 47, ♂, ♀ (Syn-types, Namibia, Kamanyab (sic) [Kamanjab] and Namibia, various localities, in SAMC) (in revision of southern African Sphecidae); Arnold 1930: 21 (in checklist of Afrotropical Sphecidae).

Bembix venusta Arnold & Lohrmann, 1948: 447 (member of *diversipennis* species group); R. Bohart and Menke 1976: 549 (in checklist of world Sphecidae); Gess and Gess 2003: 125 (flower visiting records); Pulawski 2013: 91 (in catalogue of world Sphecidae sensu lato).

Material examined. ANGOLA: Eriksons' Drift, Kunene River [circa 17.15S, 14.36E], iii.1923 (S.W. Africa Mus. Exped.) [A.J. Hesse et al.], paratype ♀, paratype ♂ [SAMC ex NMBZ]. NAMIBIA: Ongandjera [17.55S, 15.05E], iii.1923 (S.W. Africa Mus. Exped.) [A.J. Hesse et al.], 1 ♀ [SAMC ex NMBZ]; [on road] 3704 to Sesfontein

57 km from Opuwa (18.29S, 13.48E), 20.iii.1999, 1 ♀; on [road] 3704 to Opuwa 53 km from Sesfontein (18.49S, 13.46E), 19.iii.1999, 1 ♀; 23 km by r[oa]d to Uis on [road] C35 from [road] C39 (20.31S, 14.5E), 1.iv.1997, 1 ♂ (visiting white flowers of *Leucas pechuelii* (Kuntze) Guerke, Lamiaceae); between Omaruru and Wilhemstal (21.31S, 16.03E), 3.iv.1998, 7 ♀♀, 4 ♂♂ (4 ♀♀, 4 ♂♂ visiting deep pink flowers of *Hermbsaedia odorata* (Burch.) T. Cooke, Amaranthaceae; 1 ♀ with prey: Bombyliidae); c[irca] 9 km S [of] Omaruru on r[oa]d to Karibib (21.32S, 15.58E), 24. iii. 1997, 1 ♂; 22 km N [of] Kalkrand (23.55S, 17.28E), 3.iv.2004, 1 ♂ (visiting yellow flowers of *Gazania pectidea* (DC.) Harv., Asteraceae) – (all F.W. and S.K. Gess) [all AMGS].

Additional localities recorded by Arnold (1929) but specimens not seen by the present authors: NAMIBIA: Ombombo [18.40S, 13.56E]; Kamanjab [19.38S, 14.49E]; Otjimbembe [locality not traced].

Geographical distribution. Northern Namibia and across the Kunene in southern Angola (Fig. 16c).

Floral associations. Recorded from three plant families: Amaranthaceae (*Hermbsaedia odorata* (Burch.) T. Cooke); Asteraceae (*Gazania pectidea* (DC.) Harv.); Lamiaceae (*Leucas pechuelii* (Kuntze) Guerke).

Nesting. Unknown.

Prey. Recorded taking one family of Diptera: Bombyliidae (one female captured with bombyliid prey).

Bembix zinni Gess

http://species-id.net/wiki/Bembix_zinni

Fig. 15d

Bembix zinni Gess, 1986: 140, figs 9–19, ♂, ♀ (Holotype, ♂, South Africa, Laingsburg District, Merweville, in SAMC); S. Gess 1996: 266, 284 (flower visiting records); Gess and Gess 2003: 126 (flower visiting records); Pulawski 2013: 93 (in catalogue of Sphecidae sensu lato).

Material examined. NAMIBIA: 24 km N [of] Palm Wag (19.43S, 13.51E), 18.iii.1999 (F.W. and S.K. Gess), 2 ♀♀ [AMGS]; Western end of Grootberg Pass (19.47S, 14.17E), 19.iii.2004 (F.W. and S.K. Gess), 1 ♀ (visiting white flowers of *Heliotropium tubulosum* E. Mey. ex DC., Boraginaceae) [AMGS]; Two Palms, Uniab River (19.53S, 13.54E), 27.iii.2004 (F.W. and S.K. Gess), 1 ♀ (at water) [AMGS]; same locality, 28.iii.2004 (F.W. and S.K. Gess), 4 ♀♀ (visiting white flowers [of] *Heliotropium tubulosum*) [AMGS]; road D344 WNW [of] Omatjete (20.57S, 15.14E), 15.iii.2004 (F.W. and S.K. Gess), 2 ♀♀ [AMGS]; Uis to Omaruru (21.14S, 15.00E), 21.iii.2004, (F.W. and S.K. Gess), 1 ♀ (visiting yellow flowers [of] *Cleome* sp., Capparaceae) [AMGS]; Gobabis [22.30S, 18.58E], 12.xii.1983 (Empey), 2 ♀♀, 3 ♂♂ [AMGS]; Nomtsas (24.25S, 16.51E), 18.iii.1997, 3 ♀♀ (1 ♀ visiting deep pink flowers of *Sesuvium sesuvioides* (Fenzl) Verdc., Aizoaceae: non-Mesembryanthema; 2 ♀♀ visiting white

flowers of *Limeum argute-carinatum* Wawra & Peyr., Molluginaceae); 18 km SE [of Stampriet on [road] C15 to Gochas (24.28S, 18.30E), 29.iii.2000, 1 ♀ (visiting white flowers of *Limeum argute-carinatum*); Gross Nabas, 24 km SE [of] Stampriet (24.30S, 18.32E), 30.iii.2000, 7 ♀♀, 1 ♂ (1 ♀ visiting orange/pink flowers of *Indigofera* sp., Papilionaceae; 6 ♀♀, 1 ♂ visiting white flowers of *Limeum argute-carinatum*); S [of] Maltahöhe, on [road] D811 (25.15S, 17.01E), 23.iii.1999, 1 ♀; 8, 10 & 24.iii.1999, 8 ♀♀, 3 ♂♂ (1 ♀ visiting white flowers of *Limeum* sp.); 2 km from [road] C17 on [road] R511 to Mata Mata (25.37S, 19.25E), 8.iii.2000, 1 ♀ 1 ♂ (♂ visiting white flowers of *Limeum argute-carinatum*); Köes to Gochas (25.39S, 19.24E), 8.iii.2000, 1 ♀, 1 ♂ (♀ with prey: Bombyliidae); Keetmanshoop/Aus, 96 km E of Aus (26.42S, 17.11E), 28.ii.2000, 1 ♀ - (all F.W. and S.K. Gess) [all AMGS]; Karasburg [28.00S, 18.43E], 14.xii.1974 (Empey), 8 ♀♀; same locality, 5.i.1975 (Empey), 4 ♀♀, 2 ♂♂ [AMGS]. SOUTH AFRICA: NORTHERN CAPE: Kalahari Gemsbok National Park, Nossob River bed, circa 20 km S of Nossob Rest Camp [circa 25.30S, 20.38E], 8.iii.1990 (F.W. and S.K. Gess), 1 ♀ (on yellow flowers *Tribulus cristatus* Presl., Zygophyllaceae); Kalahari Gemsbok National Park, Nossob River bed, 11 km NNE of Twee Rivieren [26.24S, 20.41E], 8–11.iii.1990 (F.W. and S.K. Gess), 3 ♀♀, 3 ♂♂ (1 ♀ on yellow flowers of *Pentzia incana* (Thunb.) Kuntze, Asteraceae; 2 ♀♀, 3 ♂♂ (on white flowers of *Limeum aethiopicum* Burm.) – (all F.W. and S.K. Gess) [all AMGS]; WESTERN CAPE: Merweville, Laingsburg Dist. [32.40S, 21.31E], i–ii.1947 and i.1959 (H. Zinn), holotype ♂, paratype ♂, 4 paratype ♀♀ [SAMC], paratype ♂, 3 paratype ♀♀ [AMGS].

Geographical distribution. Previously known only from the type locality. The here listed data indicate an extensive and continuous distribution ranging in the north from Palm Wag in Namibia to, in the south, the Kalahari Gemsbok National Park in South Africa. At present the type locality, Merweville in the Western Cape, appears separated from the above, most probably due to a hiatus of collecting (Fig. 16d). It is probably at the southern limit of the species' distribution.

Floral associations. Recorded from seven plant families: Apiaceae (*Deverra denudata* (Viv.) Pfisterer & Podl.); Molluginaceae (*Limeum aethiopicum* Burm. and *Limeum argute-carinatum* Wawra & Peyr.); Aizoaceae (non-Mesembryanthema, *Sesuvium sesuvioides* (Fenzl) Verdc.); Asteraceae (*Pentzia incana* (Thunb.) Kuntze); Boraginaceae (*Heliotropium tubulosum* E. Mey. ex .DC.); Capparaceae (*Cleome* sp.); Fabaceae (Papilionoideae, *Indigofera* sp.; Zygophyllaceae (*Tribulus cristatus* Presl.).

Nesting. Unknown.

Prey. Unknown.

Discussion of geographical distributions, flower associations and prey

The distribution records here assembled make possible the recognition of geographical distribution patterns for many of the species occurring in southern Africa, however,

for others the number of records remains too few, drawing attention to species which require purposeful collecting.

The most widespread with respect to both latitude and longitude are *B. capensis* (Fig. 6c) and *B. fuscipennis* (Fig. 9d). Neither is restricted to southern Africa, the distributions of both extend northwards, the former to Egypt and the latter to Ethiopia in the northeast and Zaire in the northwest.

Widespread throughout South Africa and Lesotho and with a single record from Zimbabwe is *B. albofasciata* (Fig. 2c).

Species with an apparently relatively widespread eastern distribution are: *B. diversipennis* (Fig. 9a), from northeastern South Africa, Zimbabwe and Mozambique to Ethiopia; *B. flavicincta* (Fig. 9b) from Limpopo, South Africa through Zimbabwe to Malawi; *B. melanopa* (Fig. 12d) principally from eastern South Africa and Zimbabwe to Kenya.

A species with an apparently relatively widespread principally western distribution within southern Africa and not extending northwards is *B. ochracea* (Fig. 14b), which appears to be a species of both the Succulent Karoo and Nama-Karoo.

Another species of the Succulent and Nama-Karoo is *B. bubalus* which has been recorded principally from the south of the Nama-Karoo in South Africa (Fig. 7a).

Bembix cameronis and *B. liturata* have been widely and repeatedly recorded from the extreme south and south west of South Africa – the former also from Lesotho and central Namibia (Fig. 7b), suggesting that it is more widespread, and the latter surprisingly has allegedly been recorded from the Victoria Falls area in Zimbabwe (Fig. 12b), requiring further investigation.

With strongly western distributions within southern Africa and associated with semi-arid to arid areas are: *B. karroensis* (Fig. 12a) apparently restricted to the Nama-Karoo; *B. namibensis* (Fig. 14a) apparently restricted to the arid areas of Namibia; *B. olivata* (Fig. 14c) apparently principally restricted to the arid areas of Namibia but also recorded from the southern Kalahari; *B. venusta* (Fig. 16c) apparently the Nama-Karoo of Namibia and Angola; *B. zinni* (Fig. 16d) principally Nama-Karoo and southern Kalahari.

Species with strictly coastal distributions (Fig. 17) are: *B. albata* along the coast of the Namib Desert to its southern extension in Namaqualand; *B. arnoldi* and *B. harenarum* along the south and south east coasts of South Africa; *B. fraudulenta* along the east coast of South Africa from the south into Mozambique.

Widespread species in northern southern Africa are: *B. ulula* (Fig. 16b) and *B. cultrifera* (Fig. 7e), not known from further north; and *B. moebii* (Fig. 12e), known to extend northwards to Tanzania and recorded from Ethiopia in northeast Africa but not from northwest Africa.

Another apparently northern species but less widespread with respect to longitude is *B. regnata* (Fig. 14d).

Two species apparently restricted to South Africa but not found in the karroid areas are *B. capicola* (Fig. 6d) and *B. sibilans* (Fig. 14f).

Comments on the distributions of the other species would be premature.

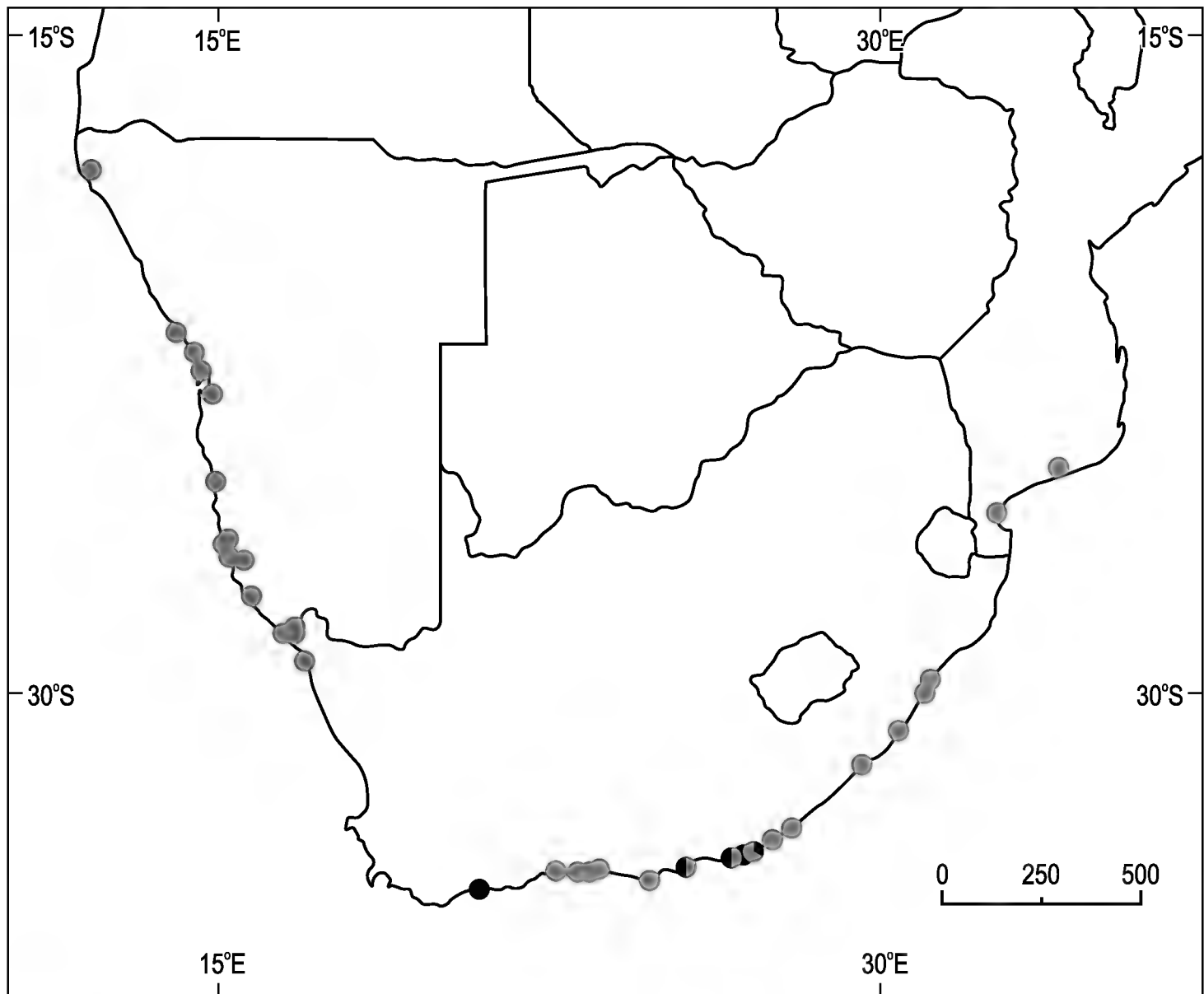


Figure 17. Combined distributions of collection records of the coastal species: *albata* (blue); *arnoldi* (black); *harenarum* (red); *fraudulenta* (yellow).

Bembix visit flowers not only to obtain nectar for adult nourishment but also when hunting. Recorded flower associations cannot therefore be assumed to be for imbibing nectar. As nectar seekers they are polyphagous.

Bembix typically prey on flies (Diptera) of various families. Unusual for the Afrotropical Region is *Bembix regnata* Parker which was found by Benson (1934) provisioning with butterflies (Lepidoptera) of three families in East Africa. In this regard it is of note that Evans and Matthews (1973, 1975) recorded considerable radiation with respect to prey taken by Australian *Bembix*. Of the 22 species studied 14 took only flies, however, one took damselflies (Odonata) in addition to flies, one bees and wasps in addition to flies, three only bees, primarily stingless bees of the genus *Trigona* (Apidae), one only tiphiid wasps, one only damselflies and yet another only antlions (Neuroptera). Species hunting flies seem to show little selection with respect to fly family, the qualifying criterion being apparently one of size and habitat.

Bembix hunt their prey on the wing. They tend to find a good source of flies, often decaying organic matter such as faeces and corpses, in the case of *B. arnoldi* ocean

wrack, but also flowers. Having found a good source of flies they return to it repeatedly. Fly prey has been recorded for 19 species of Afrotropical *Bembix*, *B. albofasciata* Smith, *B. arnoldi* Arnold, *B. bequaerti dira* Arnold, *B. braunsii* Handlirsch, *B. bubalus* Handlirsch, *B. cameronis* Handlirsch, *B. capensis* Lepeletier, *B. capicola* Handlirsch, *B. flavocincta* Turner, *B. forcipata* Handlirsch, *B. fraudulenta* Arnold, *B. fuscipennis* Lepeletier, *B. massaica* Cameron, *B. moebii* Handlirsch, *B. olivata* Dahlbom, *B. sibilans* Handlirsch, *B. ugandensis* Turner and *B. zinni* Gess (Gess 1986, Gess and Gess 1989 and Gess and Gess fieldnotes and voucher specimens 2000). Thirteen fly families, Stratiomyidae, Tabanidae, Mydidae, Asilidae, Bombyliidae, Syrphidae, Conopidae, Muscidae, Calliphoridae, Sarcophagidae, Tachinidae, Glossinidae and Nemestrinidae, have been recorded for *Bembix* in southern Africa. The number of families represented in the prey of a single species ranging up to 11!

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References

- Arnold G (1929) The Sphegidae of South Africa. Part 13. *Annals of the Transvaal Museum* 13: 320–380.
- Arnold G (1930) A check-list of the Sphegidae of the Ethiopian Region. University Press, Cambridge, England, 1–21.
- Arnold G (1931) The Sphegidae of South Africa. Part 15. *Annals of the Transvaal Museum* 14: 135–220.
- Arnold G (1933) Entomological expedition to Abyssinia, 1926–7. Hymenoptera II: Sphegidae and Psammocharidae. With an introductory note and supplementary list by Hugh Scott, Sc. D. *The Annals and Magazine of natural History* (series 10) 11: 351–357.
- Arnold G (1935) Scientific results of the Vernay-Land Kalahari expedition, March to September, 1930, Sphegidae and Psammocharidae. *Annals of the Transvaal Museum* 16: 497–505.
- Arnold G (1936) New African Hymenoptera. No.3. *Occasional Papers of the Rhodesian Museum* 5: 1–38.
- Arnold G (1944) New species of African Hymenoptera. No. 5. *Occasional Papers of the National Museum of Southern Rhodesia* 2: 1–38.
- Arnold G (1946) New species of African Hymenoptera. No. 6. *Occasional Papers of the National Museum of Southern Rhodesia* 2: 49–97.
- Arnold G (1951) Sphecidae and Pompilidae (Hymenoptera) collected by Mr. K.M. Guichard in West Africa and Ethiopia, 1941–1948. *Bulletin of the British Museum (Natural History), Entomology* 2: 97–183.
- Arnold G (1952) New species of African Hymenoptera. No. 10. *Occasional Papers of the National Museum of Southern Rhodesia* 2: 460–493.
- Arnold G (1960) New species of African Hymenoptera. No. 15. *Occasional Papers of the National Museum of Southern Rhodesia* 3: 460–493.
- Batholomew JPJM, Geelen HAG, Lewis P, Middleton P, Winkleman (Eds) (1981) *The Times Atlas of the World (Comprehensive Edition)*. Times Books Limited, London.
- Benson RB (1934) *Bembix regnata* Parker preying on butterflies. *Proceedings of the Royal entomological Society of London* 9: 75–76.
- Berland L (1950) Contribution à l'étude de l'Aïr. Hyménoptères Sphecoidea, Vespoidea, Ichneumenoidea. *Mémoires de l' Institut Français d' Afrique Noire* 10: 294–301.
- Bingham CT (1902) On the Hymenoptera collected by Mr W.L. Distant in the Transvaal, South Africa, with descriptions of supposed new species. *The Annals and Magazine of natural History* (series 7) 9: 340–353, 10: 207–222.
- Bohart RM, Menke AS (1976) *Sphecid wasps of the world*. University of California Press, Berkley: i-ix, 1–695.

- Brauns H (1911) Biologisches über südafrikanische Hymenoptera. Zeitschrift für Wissenschaftliche Insektenbiologie 7: 16–19.
- Callan EMcC (1964) Ecology of sand dunes with special reference to the insect communities. In: Davis DHS (Ed) Ecological studies in southern Africa. Junk, The Hague, 174–185.
- Cameron P (1908) Hymenoptera. 7. Fossores. In: Sjöstedt Y (Ed) Wissenschaftliche Ergebnisse der schwedischen zoologischen Expedition nach dem Kilimanjaro, dem Meru und den umgebenden Massaisteppe Deutsch-Östaficas 1905–1906. 2. Band, Abteilung 8–14. P. Palmquists Aktiebolag, Stockholm, 197–296 (cover dated 1910 but page 294 dated March 1908).
- Cameron P (1910) On the Aculeate Hymenoptera collected by Mr. A.J.T. Janse, Normal College, Pretoria, in the Transvaal. Annals of the Transvaal Museum 2: 116–167.
- Carpenter GDH (1917) Observations on fossors in East Africa. Proceedings of the entomological Society, London 1917: xli-xliv.
- Carpenter GDH (1920) A naturalist on Lake Victoria with an account of sleeping sickness and the tse-tse fly. Fisher Unwin, London.
- Casolari C, Casolari Moreno R (1980) Cataloghi. I. Collezione Imenotterologica di Massimiliano Spinola. Museo Regionale di Scienze Naturali, Torino, 1–165.
- Cuthbertson A (1933) The habits and life histories of some Diptera in Southern Rhodesia. Proceedings of the Rhodesia Scientific Association 32: 81–111.
- Cuthbertson A (1939) On the biology of *Craticulina tabaniformis* F. (Diptera: Sarcophagidae) which breeds in the nests of sand wasps *Bembex* (Sphegidae). Journal of the Entomological Society of Southern Africa 1: 1–8.
- Dahlbom AG (1845) Hymenoptera Europaea, praecipue borealia; formis typicus nonnullis specierum generumque exoticorum aut extraneorum propter nexum systematicum associatis – I. Spex in sensu Linneano, ibid. 1843–1845.
- Dalla Torre KW von (1897) Catalogus Hymenopterorum hucusque descriptorum systematicus et synonymicus, Volumen VIII: Fossores (Sphegidae). Guilelmi Engelmann, Lipsiae [Leipzig], 1–749.
- De Beaumont J (1967) Hymenoptera: Sphecidae. South African Animal Life 13: 502–512.
- De Melo GAR (2000) Comportamento social em vespas da familia Sphecidae (Hymenoptera, Apoidea). In: Martins RP, Lewinsohn TM, Barbeitos MS (Eds) Ecologia e comportamento de insetos. Oecologia Brasiliensis 8: 85–130.
- Evans HE (1957) Studies on the comparative ethology of digger wasps of the genus *Bembix*. Comstock Publishing Associates, Ithaca, New York, 248 pp.
- Evans HE (1966) The comparative ethology and evolution of the sand wasps. Harvard University Press, Cambridge, Mass., xvi, 526 pp.
- Evans HE, Mathews RW (1971) Notes on the prey and nests of some Australian Crabronini. Journal of Australian Entomology 10: 1–4. doi: 10.1111/j.1440-6055.1971.tb00001.x
- Evans HE, Mathews RW (1973) Systematics and nesting behavior of Australian sandwasps (Hymenoptera, Sphecidae). Memoirs of the American Entomological Institute 20: i–iv, 1–387.
- Evans HE, Mathews RW (1975) The sand wasps of Australia. Scientific American 233: 108–115. doi: 10.1038/scientificamerican1275-108

- Evans HE, O'Neill KM (1988) The natural history and behaviour of North American beewolves. Comstock Publishing Associates, Cornell University Press, Ithaca and London, 1–278.
- Evans HE, O'Neill KM (2007) The Sand Wasps: Natural History and Behavior. Harvard University Press, Cambridge Massachusetts, 1–340.
- Evenhuis NL (2013) Abbreviations for insect and spider collections of the world. <http://hbs.bishopmuseum.org/codens/codens-inst.html> [accessed on 7 October 2013]
- Gadallah NS (2002) Male genitalia as a diagnostic character in determining *Bembex* F. species from Egypt (Hymenoptera: Sphecidae). *Zoology in the Middle East* 25: 59–66. doi: 10.1080/09397140.2002.10637906
- Gadallah NS (1997) Revision of the Egyptian species of the genus *Bembix* (Hymenoptera: Sphecidae). *Bollettino della Società Entomologica Italiana* 129: 257–270.
- Gadallah NS, Assery BM (2004) A review of the Sphecidae (with the exception of Larrinae) of the Jeddah Region (west of Saudi Arabia). With a checklist of the species known from Saudi Arabia. *Linzer Biologische Beiträge* 36: 215–239.
- Gess FW (1981) Some aspects of an ethological study of the aculeate wasps and bees of a karroid area in the vicinity of Grahamstown, South Africa. *Annals of the Cape Provincial Museums (natural History)* 14: 1–80.
- Gess FW (1986) Three new species of southern African *Bembix*, a new synonymy, and biological notes on other species of the genus (Hymenoptera: Sphecidae: Nyssoninae). *Annals of the Cape Provincial Museums (natural History)* 16: 137–160.
- Gess FW, Gess SK (1988) Terrestrial invertebrates: Insects. In: Lubke RA, Gess FW, Bruton MN (Eds) A Field Guide to the Eastern Cape Coast. The Grahamstown Centre of the Wildlife Society of Southern Africa, Grahamstown, 241–250.
- Gess FW, Gess SK (1998) Terrestrial invertebrates: insects. In: Lubke RA, de Moor I (Eds) Field Guide to the Eastern and Southern Cape Coasts. University of Cape Town Press, Cape Town, 344–345.
- Gess SK, Gess FW (1989) Notes on nesting behaviour in *Bembix bubalus* Handlirsch in southern Africa with emphasis on nest sharing and reaction to nest parasites (Hymenoptera: Sphecidae). *Annals of the Cape Provincial Museums (natural History)* 18: 151–161.
- Gess SK, Gess FW (1994) Potential pollinators of Polhills's Cape Group of Crotalariaeae (Fabales: Papilionaceae), with implications for seed production in cultivated rooibos tea. *African Entomology* 2: 97–106.
- Gess SK, Gess FW (2003) A catalogue of flower visiting records for aculeate wasps and bees in the semi-arid to arid areas of southern Africa. Albany Museum, Grahamstown, 1–529.
- Giordani Soika G (1939) Raccolte entomologiche del Dr. Alfredo Andreini in Eritrea. Vespidae e Sphegidae (Hymenoptera). *Memorie della Società Entomologica Italiana* 71: 72–74.
- Guichard KM (1989) The genus *Bembix* (Hymenoptera: Sphecidae) in Saudi Arabia. *Fauna of Saudi Arabia* 10: 134–151.
- Guiglia D (1931) Spedizione del Barone Raimondo Franchetti in Dancalia. Imenotteri Aculeati. *Annali del Museo Civico di Storia Naturali Giacomo Doria* 55: 157–164.
- Guiglia D (1943) Missione biologica Sagan-Omo diretta dal Prof. E. Zavattari. Nuove specie d'Imenotteri Aculeati (Pompilidae-Sphecidae). *Diagnosi preventive. Bollettino della Società Entomologica Italiana* 75: 68–76.

- Guiglia D (1950) Missione biologica Sagan-Omo diretta dal Prof. Edoardo Zavattari. Hymenoptera Tenthredinidae, Scoliidae, Pompilidae, Sphecidae. Annali del Museo Civico di Storia Naturale di Genova 64: 207–260.
- Handlirsch A (1893) Monographie der mit *Nysson* und *Bembex* verwandten Grabwespen. VII. Sitzungsberichte der Kaiserlichen Akademie der Wissenschaften in Wien. Mathematisch-Naturwissenschaftliche Classe. Abtheilung I. 102: 657–942.
- Handlirsch A (1895) Nachträge und Schlusswort zur Monographie der mit *Nysson* und *Bembex* verwand Grabwespen. Sitzungsberichte der Kaiserlichen Akademie der Wissenschaften. Mathematisch-Naturwissenschaftliche Classe. Abtheilung I. 104: 801–1079.
- Hesse AJ (1956) A revision of the Bombyliidae (Diptera) of Southern Africa. Annals of the South African Museum 35: 1–972.
- Kohl FF (1906) Zoologische Ergebnisse der Expedition der Kaiserlichen Akademie der Wissenschaften nach Südarabien und Sokótra im Jahre 1898–1899. Hymenopteren. Denkschriften [der] Kaiserlichen Akademie der Wissenschaften in Wien. Mathematisch-Naturwissenschaftliche Klasse 71: 169–301, pls I–IX.
- Leclercq J (1955) Contribution à l'étude de la faune entomologique du Ruanda-Urundi (Mission P. Basilewsky 1953). LXXVII. Hymenoptera Sphecidae. Annales du Musée Royal du Congo Belge (Annalen van het Koninklijk Museum van Belgisch-Congo) Tervuren, Belgique, in 8°, Zoologie 40: 404–426.
- Lepeletier de Saint-Fargeau A (1845) Histoire naturelle des Insectes. Hyménoptères. Vol. 3. Roret, Paris, 1–644.
- Lohrmann E (1939) Formenketten und Stammbäume in der Grabwespengruppe der Bembicinen. Archiv für Naturgeschichte. Abteilung B (Neue Folge) 8: 131–144.
- Lohrmann E (1948) Die Grabwespengruppe der Bembicinen. Übersicht und Stammesgeschichte. Mitteilungen der Münchner Entomologischen Gesellschaft 34: 420–471.
- Magretti P (1899) Imenotteri dell'ultima spedizione del Cap. Bottego. Annali del Museo Civico di Storia Naturale de Genova 39: 583–612.
- Pagliano G (2011) Gli Sfeciformes (Hymenoptera) della collezione Spinola. Parte II. Bollettino del Museo Regionale di Scienze Naturali di Torino 28: 109–160.
- Parker JB (1929) A generic revision of the fossorial wasps of the tribes Stizini and Bembicini, with notes and descriptions of new species. Proceedings of the United States National Museum 75: 1–203. doi: 10.5479/si.00963801.75-2776.1
- Parker JB (1942) Notes on certain species of Bembicids. Proceedings of the Entomological Society of Washington 44: 202–209.
- Pulawski WJ (2013) Catalog of Sphecidae sensu lato (= Apoidea excluding Apidae). http://research.calacademy.org/ent/catalog_sphecidae [accessed on 27.ix.2013]
- Radoszkowski O (1881) Hyménoptères d'Angola. Jornal de Sciencias Mathematicas, Physicas e Naturaes 8: 197–221.
- Schouteden H (1930) Les genres congolais de Sphégides. Revue de Zoologie et de Botanique Africaines 20: 90–96.
- Smith F (1856) Catalogue of the Hymenopterous Insects in the collection of the British Museum. IV. London. Sphegidae, Larridae and Crabronidae. Taylor and Francis, London, 207–497.

- Smith F (1973a) Descriptions of new species of fossorial Hymenoptera in the collection of the British Museum. *Annals and Magazine of natural History* (series 4) 12: 49–59, 99–108.
- Smith F (1973b) Descriptions of new species of fossorial Hymenoptera in the collection of the British Museum, and of a species of the rare genus *Iswara*, belonging to the Family Doryliidae. *Annals and Magazine of natural History* (series 4) 12: 253–260, 291–300, 402–415.
- Spinola M (1938) Compte rendu des Hyménoptères recueillis par M. Fisher, pendant son voyage en Egypte, et communiqués par M. le Dr Watl. *Annales de Société France* 7: 437–546.
- Taschenberg EL (1870) Die Larridae und Bembecidae des zoologischen Museums der hiesigen Universität. *Zeitschrift für die Gesamten Naturwissenschaften* 36: 1–27.
- Turner RE (1912a) Notes on fossorial Hymenoptera. VIII. On some new species from Africa. *Annals and Magazine of natural History* (8) 10: 410–423. doi: 10.1080/00222931208693150
- Turner RE (1912b) Notes on fossorial Hymenoptera. X. On new species from the Oriental and Ethiopian Regions. *Annals and Magazine of natural History* (8) 10: 361–377. doi: 10.1080/00222931208693249
- Turner RE (1913) On new species of fossorial Hymenoptera from Africa, mostly Elidinae. *Transactions of the Entomological Society of London* 1912: 720–754.
- Turner RE (1917a) Notes on fossorial Hymenoptera. XXVIII. On new Ethiopian species of *Bembex* in the British Museum. *Annals and Magazine of natural History* (8) 19: 436–441. doi: 10.1080/00222931709486960
- Turner RE (1917b) Notes on fossorial Hymenoptera. XXIX. On new Ethiopian species. *Annals and Magazine of natural History* (8) 20: 289–298. doi: 10.1080/00222931709487007
- Ulyett GC, De Vries AH (1940) Observations on the natural control of sheep blowflies in South Africa. Part I. Predatory wasps of the genus *Bembix* Fabr. Union of South Africa Department of Agriculture and Forestry Bulletin 224.